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Report of the Council of the United Nations University for 1994

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I. THE FOCAL POINT OF THE UNITED NATIONS UNIVERSITY: GLOBAL CHANGE AND GLOBAL RESPONSIBILITIES - OVERVIEW

1. 1994 marks the completion of 19 years of academic work by the United Nations University (UNU). As the University moves towards its twentieth anniversary in 1995, the Council of the University, at its forty-first session held in Accra, Ghana, during 28 November to 2 December 1994, took stock of the progress made in implementing work under the Medium-Term Perspective II (1990-1995). In its deliberations, the Council reviewed a report prepared by an internal assessment group convened by the Council, together with an institutional strategy paper and mission statement presented by the Rector. These discussions led to specific recommendations by the Council for improving the effectiveness of the UNU, both as an international academic institution and as the academic arm of the United Nations system.

2. The overall frame for the University's work during the mid-1990s has been its second Medium-Term Perspective (MTP II) (1990-1995) entitled: "Global Change and Global Responsibilities". The MTP II document sets out the perspectives and approaches which are to guide the work of the University into the twenty-first century. It aggregates concerns and problems to be addressed by UNU within five programme areas:

- Universal human values and global responsibilities;
- New directions for the world economy;
- Sustaining global life-support systems;
- Advances in science and technology; and
- Population dynamics and human welfare.

3. 1994 represents the fifth year of UNU activity under MTP II. The annual report of the UNU for 1994 continues an approach and style first used with the 1992 report attempting to focus attention on the University's work at the level of issues in order to allow the reader to discern the overall directions and trends of the University's ongoing work within a one-year period. The 1994 report differs from previous reports in that it reports on active work carried out within each of 19 "programmes" being undertaken during the 1994-1995 biennium. The report continues to highlight perspectives, impacts and results achieved during the year in order to put together a larger, more holistic picture of the knowledge gained or illuminated out of UNU scholarly work.

4. The report also ascribes to the descriptions of ongoing efforts the specific UNU research and training centre or programme (RTC/P) responsible for carrying out these activities. (See annex I for a summary by programme area and UNU functional unit.) In 1994, the UNU had four research and training centres (RTCs): the World Institute for Development Economics Research (UNU/WIDER) in Helsinki, Finland; the Institute for New Technologies (UNU/INTECH) located in Maastricht, the Netherlands; the International Institute for Software Technology (UNU/IIST) in Macau; and the Institute for Natural Resources in Africa

(UNU/INRA) located in Accra, Ghana. In addition, the UNU continued with its Programme for Biotechnology in Latin America and the Caribbean (UNU/BIOLAC) in Caracas, Venezuela. The descriptions of UNU academic work in 1994 also contain references to universities, research institutes and NGOs with which the University collaborates in conducting these activities. The report also identifies specific linkages or cooperation with other United Nations organizations or attempts to draw attention to a UNU contribution to the work of another part of the United Nations system.

5. This report is by no means complete or exhaustive in its coverage of academic activities of the UNU during 1994. What is attempted in this report, however, is to provide the reader with an overall view of the varied and far-reaching nature of UNU research, capacity-building and dissemination. The UNU is one of the smaller United Nations organizations. Its annual budget pales in comparison to those of the specialized agencies or even departments within the United Nations Secretariat. Yet, the University is increasingly being called on to enhance the nature and impact of its contributions both to the United Nations and to the international scholarly community. To bring additional light to UNU capacity-building and dissemination efforts, special sections describing this work in greater detail are included after the main description of the UNU academic programme under each of the five programme areas.

6. A final section of the report, The State of the University - 1994, gives some of the highlights of the University's institutional development during the year and draws out some of the major concerns which faced the overall University system in 1994.

II. THE UNIVERSITY'S WORK: ISSUES AND CHALLENGES

A. Universal human values and global responsibilities

Background

7. The overall objective of research in this area has been to come to a better understanding of the social, economic and even technological factors which affect the process of development. In 1994, the UNU continued to focus on issues of peace, security, conflict resolution and governance under the first programme area of MTP II: universal human values and global responsibilities.

8. UNU activities under this theme are grouped within four programmes aimed at addressing the complex issues involved in managing change in an increasingly interdependent world.

- The first programme: "The United Nations System, Global Governance and Security" is concerned with the evolving role of the United Nations as seen against the expanding demands for peace and security and social development. These activities are carried out primarily from the University Centre in Tokyo.

- A second programme: "Conflict Resolution and Ethnicity" takes up issues of ethnic conflict and conflict resolution. A joint initiative with the University of Ulster, Northern Ireland, the "International Programme on Conflict Resolution and Ethnicity (INCORE)", serves as the institutional framework for activities in this programme.

- A third programme: "Governance, State and Society" comprises start-up and exploratory activities for a possible UNU research and training centre (RTC) on the Study of Governance (UNU/CESG) to be located in Barcelona, Spain, and ongoing research coordinated by UNU/WIDER in Helsinki, Finland.

- A fourth programme: "Culture and Development" is implemented in cooperation with the Asian-Pacific Center in Fukuoka City, Japan.

UNU Agenda for Peace and Global Governance

9. During spring, the Rector put together a special advisory team to assist him in rethinking and reframing UNU work within the four programmes under this theme. The work of the advisory team resulted in a "UNU Agenda for Peace and Global Governance". The advisory team met in Tokyo in July and in Barcelona in October, and considered background papers on state-of-the-art research and policy thinking specially commissioned for this purpose. The work of the advisory team was meant to assist the University in choosing a specific direction and focus for a five-year programme of research, policy reflection and training in the area of peace and global governance. A similar approach to programme development was used in 1993 to formulate the UNU's Programme on Environmentally Sustainable Development ("UNU Agenda 21").

10. The UNU's Agenda for Peace and Global Governance proposes activities to be undertaken by the UNU or to be financed and managed by UNU, but also indicates where the University might instead play a catalytic role, facilitating and supporting the work of others in the context of a consistent overall programme framework. It also aggregates, under a new frame, ongoing UNU academic activities in this area.

The United Nations system, global governance and security

11. During the year, research within this programme attempted to draw out lessons from the experience gained from United Nations peace-keeping operations, with specific reference to humanitarian relief efforts and the relationship between the United Nations and regional organizations. One project, for example, looked at the United Nations Observer Mission in Liberia and drew on a team of experts from the Thomas J. Watson Institute for International Studies at Brown University, the United States. The study focused on the relationship of the United Nations and the Economic Community of West African States (ECOWAS) that was deeply involved in the resolution of civil strife in Liberia. Preliminary results from the study identified three key elements essential to the peace process in Liberia: (a) disarmament; (b) demobilization and rehabilitation; and (c) restoration of the economy. The results of the study are being shared with policy makers, United Nations officials, media

professionals and scholars at a meeting being organized in New York in early 1995.

12. In a related effort, the UNU organized a regional conference on the issue of peace and security in Latin America and participated in a similar meeting focused on African peace and security issues. "The UNU Conference on the role of regional organization in peace-keeping: The case of Latin America" was organized in Mexico City in May in cooperation with the Mexican Autonomous Institute of Technology (ITAM) and addressed issues such as the problems encountered in peace-building in El Salvador and Nicaragua, and the legal and political basis for involvement of regional organizations, such as the Organization of America States (OAS), in the maintenance of peace and security in coordination with the United Nations. Security issues, as defined under the new conceptual approaches to security contained in Dr. Boutros Boutros-Ghali's "An Agenda for Peace" were also central to the discussion.

13. The University collaborated with the Government of Egypt and the International Peace Academy in organizing a symposium in May on the mechanism of conflict prevention, management and resolution used by the Organization of African Unity (OAU). The symposium, held in Cairo, brought together 130 government officials and international experts to identify the specific mechanisms which would be required for the OAU to play a role in regional peace and security.

14. Given the absence of multilateral regional security institutions and the urgent need to construct some security-related arrangements in North-East Asia, a UNU project on North-East Asian Regional Security and the Role of International Institutions contributes to the University's goal of bringing together persons and countries of different perspectives in an effort to devise proposals aimed at conflict resolution. The project is analysing North-East Asian security and regional organizations and arrangements to encourage collective security and confidence-building measures, with particular emphasis on the current problems of nuclear proliferation on the Korean peninsula and disputed territorial claims in the South China Sea. Results of the research are being summarized in an executive summary targeted for policy makers; journal articles and a book will also serve to disseminate the research findings.

15. As a contribution to the growing involvement of the United Nations in large-scale clearance of landmines as one of the primary activities of post-conflict peace-building, the University undertook a study to examine the nature of modern technologies for mine detection and clearance. The study's primary objective was to explore ways to increase the speed and accuracy with which landmines, including the non-metallic variety, are located and destroyed. The report emanating from the study analyses current technologies being utilized for mine detection and mine clearance purposes, and assesses those technologies in the developmental stages that are likely to provide major advances for improved mine clearance capabilities. The report has been made available to the General Assembly and directly to concerned Member States also recommends possible strategies to improve the equipment situation for clearing mines within a humanitarian context. 1/

16. Continuing UNU research on multilateralism and the United Nations system has concentrated on the interaction of two dynamics: (i) the changing structure of world order; and (ii) the process of international organization. An international symposium on sources of innovation in multilateralism was held, in cooperation with the University of Lausanne, Switzerland, in May to re-examine the nature of global changes and the challenges posed to the United Nations, including its reform proposals, as well as emerging new social forces such as women's movements, endogenous peoples, human rights activists and others. The symposium, attended by some 30 participants and involving graduate students of the University of Lausanne, reviewed a set of preliminary research papers which helped to generate specific findings on development strategies, hunger, technology, ecosystems, human rights and security issues related to multilateralism. Project activities will conclude in 1995 and specific research findings will be reviewed for inclusion in various dissemination vehicles.

17. Two volumes covering UNU work in this area were issued by UNU Press during the year: State, Society, and the United Nations System: Changing Perspectives on Multilateralism; 2/ and The United Nations System: The Policies of Member States. 3/ These publications provide information and analysis of Member States' perspectives and policies towards the United Nations in the perspective of evolving multilateralism, and are meant to assist both policy makers and scholars.

18. In October, UNU Press issued a volume entitled: Global Transformation: Challenges to the State System. 4/ This book emanates from the work of a network of scholars which was reviewed at an international symposium held in Yokohama, Japan, in 1992. It examines the questions of internationalization of the State, globalization of the political economy, transnational social movements and finally, change, violence and normative order with special reference to the United Nations. It is a result of collaborative efforts of 20 scholars from around the world representing a comprehensive critical reflection on contemporary global transformation.

19. In broadening its involvement with a younger generation of students, the UNU organized its tenth Global Seminar involving students and faculty from some eight Japanese universities. This year's seminar addressed the theme "The United Nations Toward the 21st Century" and was organized jointly with the Kanagawa Foundation for Academic and Cultural Exchange (K-Face) in September. Graduates from UNU Global Seminars now number more than 1,000, some of whom are teaching at universities, working for the United Nations, research institutes, media and corporations. These graduates have formed a student association for the UNU which organizes regular study group meetings on subjects related to the work of the UNU.

20. A continuing activity within this programme in 1994 was the organization of the Japan-ASEAN Forum, first established in 1990. The forum is designed to encourage dialogue between scholars and officials in Japan and the ASEAN countries. The Forum was held in December in Bangkok, Thailand, in cooperation with the Institute of Asian Studies, Chulalongkorn University, under the theme of regional cooperation and culture. The Forum focused on the interface between culture and development in a cross-national perspective and attempted to identify the steps that should be taken by Governments, other organizations and

individuals for cooperation based on deepened cultural understanding between the ASEAN members and Japan. Papers prepared for the Forum are being published in the "Japan-ASEAN Forum" series.

Conflict resolution and ethnicity

21. Parallel to research described previously on the role of regional organizations in peace-keeping operations is a UNU study of peace-keeping operations from the perspective of individual country experience. This research is being conducted within the International Programme on Conflict Resolution and Ethnicity (INCORE), a joint initiative launched in early 1993 by the UNU and the University of Ulster, Northern Ireland. Activities during 1994 focused on a comparative study of the experience and involvement of India, Ireland and Sweden. These countries were selected for investigation because of their contrasting experiences with regard to training and preparation for such operations. Their selection also allows for a comparison of European and third world perspectives. The three case-studies have been complemented by (1) comparative studies of selected United Nations missions; (2) interviews with key personnel who have experience in civilian and military peace-keeping, and national policy makers responsible for making commitments to peace-keeping operations; (3) analysis of United Nations documentation and reports to examine in particular the need for better coordination between the United Nations Headquarters in New York and field commanders directly involved in peace-keeping operations; and (4) analysis of press reports to gauge public reaction to the way in which peace-keeping operations are conducted. The results of the studies will be published and disseminated to Member States and decision makers within the United Nations system in 1995.

22. To further the development of the INCORE initiative, a workshop was held in February involving trainers and scholars to examine possible approaches to the training of practitioners, policy makers and academics and how they can work together more constructively. The workshop led to specific recommendations for future training programmes to be organized under INCORE.

23. Also within this programme, the UNU, jointly with International Alert and the Nairobi Peace Initiative, organized a seminar in Mombasa, Kenya, on practical skills for the prevention, resolution and transformation of internal conflicts using a variety of theoretical concepts and models. Innovative presentations included experimental exercises, role-playing and simulations, along with more traditional lecture formats.

Governance, State and society

24. Programme activities funded by the Directorate-General of Research of the Generalitat of Catalunya, Spain, and based on cooperation agreements between the UNU and the major universities in the region, have marked progress towards the establishment of a UNU research and training centre for the study of governance in Barcelona. In 1994, these activities included preparatory work - state-of-the-art surveys, definition of a conceptual framework and institutional linkages for future programme action - in two main areas: ethics and governance, and the interface between political, institutional and economic aspects of governance. They involved also two international events in the area of environmental

management, on issues recommended in the report of the Rector's Advisory Team on Agenda 21: a workshop on the teaching of international environmental law, coordinated by Professor Edith Brown-Weiss of Georgetown University, the United States, and a research workshop on compliance with environmental accords, coordinated by the Institute of International Environmental Governance (IIEG) of the University of Dartmouth, the United States.

25. In September, a joint programming commission met to advise the UNU and the Generalitat on a set of academic activities to be funded by the Directorate-General of Research in 1995 leading to the establishment of UNU/CESG along the lines agreed in a 1992 accord between the UNU and the Generalitat of Catalunya. The joint commission noted with satisfaction the active backstopping of the programme by universities in Barcelona, and the fact that it had stimulated collaborative linkages among them.

26. Earlier in the year, the UNU and the Independent Commission on Global Governance, under the leadership of Ingvar Carlsson, now Prime Minister of Sweden, organized a special public symposium on issues of global governance at the University's headquarters in Tokyo. The symposium, held in April and attended by more than 300 scholars, diplomats, NGO representatives, religious leaders, and journalists, addressed issues of peace and security, development, environment, and shared universal human values and norms that go beyond the concept of international cooperation in the "global neighbourhood". Dr. Sadako Ogata, United Nations High Commissioner for Refugees, spoke of the "governance of humanitarian crises" and the complex nature of operations to protect refugees in conflict situations. The invitees, following the presentations by eminent panelists, concentrated on the concept of "governance", institutional mechanisms including United Nations reforms, the need for global learning and education, and the interlinkages between security and development, particularly the problems confronting the developing countries in the post-cold-war era.

27. UNU/WIDER has contributed to the University's collective efforts in this programme through a comparative study of emerging regions and their role in shaping a new world order within a project entitled: "New Regionalism and the International System: Implications for Development and Security". The study compares various emerging regions with regard to their degrees of "regionness" defined as having a distinct identity, the capability to act, legitimacy, and a structure for decision-making. This comparative research project is focusing on economic development, ecological sustainability and security issues and seeks to assess the impact of this transformation on the United Nations system.

Culture and development

28. Some progress was made in 1994 in the implementation of activities within the UNU Programme on "Culture and Development" based at the Asian-Pacific Center in Fukuoka City, Japan. A comparative study on "Views of environment in Asian countries: their relationship to sustainable development" will form the initial research undertaking in this programme. A regional workshop of researchers was held in Fukuoka in May with the participation of 15 scholars from eight countries in Asia. The workshop reviewed a research proposal prepared by the coordinator as well as the schedule and organization of actual research to be

undertaken. The joint initiative was launched in 1992 with the conclusion of an agreement of cooperation between the UNU and the Asian-Pacific Center.

29. 1994 also saw the release of results from a UNU study 5/ on the relationship between culture and violence issued by UNU Press. This volume, essentially a collection of essays, provides new insights and focus for a better understanding of violence and its specific cultural connections. The study balances individual case-studies - covering Bolivia, Brazil, Chile, Colombia, Uganda, the United States and Venezuela - with more theoretical approaches considering such subjects as forms of violence, and their root causes, the use of ethnic myth in power and violence, State terrorism, gender and class factors, violence against children, drug-related violence and human rights. UNU dissemination efforts are targeted at policy makers, scholars and students of international relations and culture.

B. New directions for the global economy

Background

30. Concern for a vital global economy and the achievement of more balanced, equitable and sustainable development has been a central focus of UNU academic work since 1975. Following initial work on the development problematique in the mid-1970s to studies of socio-cultural and the socio-economic factors of the development process in the mid-1980s, the UNU established in 1985 its first research and training centre, UNU/WIDER in Helsinki, to study economic policies, especially on a global scale, that might help bring about improvements in managing the process of development.

31. UNU work during 1994-95 under this theme is carried out within three programmes:

- The first programme: "Growth and Sustainable Development: Evolving Global, Regional and National Structures and Mechanisms", undertaken primarily by UNU/WIDER, approaches the issue of growth and sustainable development by analysing the evolving structures and mechanisms at the global and regional levels.

- A second programme: "Socio-economic Dimensions of Development: Employment, Equity and Gender Issues" concentrates on issues such as employment creation, equity, gender and patterns of development cooperation and official development assistance. UNU/WIDER and UNU/INTECH are the primary institutional loci for UNU activities within this programme.

- The third programme: "Global Change and Perspectives" focuses on the socio-economic implications of global change and confronts questions relating to the restructuring of the global military sector. The activities are carried out from a base at the UNU headquarters in Tokyo and through UNU/WIDER in Helsinki.

Growth and sustainable development: evolving global, regional and national structures and mechanisms

32. In an in-house study conducted at UNU/WIDER on "Resource Mobilization and Sustainable Growth in Africa" some progress was made towards outlining a set of consistent and feasible fiscal, monetary and institutional plans to mobilize human, financial, technological and environmental resources to achieve a self-sustaining path of long-term growth. Specific activities in 1994 included data analysis, and summarizing country study and research findings from available time-series data from Africa. The overall objective of this project is to formulate a sensible course of action for the resource-based economies in Africa so as to move the continent from a reluctant adjustment course to a sustained path of growth and development.

33. Research activities within the project on "The Evolving New Market Economies in Europe and Asia - Integration into the World Economy, the Changing Internal and External Factors and the Global Implications" concentrated during the year on the external, regional and global implications of change and on the interaction of domestic and external factors in Central and Eastern European countries, Russia and the Commonwealth of Independent States (CIS). The project is looking simultaneously to the interests and policies of the main external partners of the former Socialist countries and the role of international organizations like the World Bank, the International Monetary Fund (IMF), the European Bank for Reconstruction and Development (EBRD), GATT, and certain United Nations agencies. The project is also analysing possible international consequences of marketization in China and Viet Nam.

34. UNU/WIDER continued to extend its previous work on stabilization and adjustment programmes with the second phase of its project on "Medium-term Development". 1994 saw the completion of several country studies which explore the growth possibilities of selected developing countries. A research conference was held in April to review drafts of the country studies. A synthesis volume drawing out key policy lessons is in the final stages of preparation by the project coordinator, Professor Lance Taylor of the Massachusetts Institute of Technology (MIT), the United States.

35. Research activities within the project "Trade and Industrialization Reconsidered" have been completed and the results were published within the first volume, Trade and Industrialization in Turbulent Times. 6/ A second volume emanating from the project entitled The Transition to Manufacturing for Export in Developing Countries: Problems and Possibilities has reached the final stages of editing and revision in preparation for the publisher. The book contains five country case-studies - Chile, Colombia, Mexico, Tanzania and Turkey - and an introduction by the project director, Professor G. K. Helleiner of the University of Toronto, Canada. Work on the third and final volume tentatively entitled Trade, Trade Policy and Industrialization in Developing Countries is expected to be completed in 1995.

36. UNU work during 1994 was also concerned with the reorientation of international development cooperation, and project activities were launched by the Academic Division in Tokyo and UNU/WIDER in Helsinki towards this end. Drawing upon the experiences of researchers and several past and ongoing studies

on international development cooperation, the project entitled "Reorienting International Development Cooperation for Sustained Growth, Equity and Human Development" is seeking to identify and analyse the major trends and issues in international development cooperation now and in the foreseeable future. The aim of the project is to come up with alternative approaches to international development cooperation that will contribute to sustained global economic growth with equity, environment and human development. The research findings will be shared with bilateral and multilateral donors and recipients with the aim of suggesting possible directions for future development cooperation.

37. A project entitled "Liberalization and Its Impact on Rural Economies of South Asia" was also launched in 1994. The research project is aimed at a determination of the impact of liberalization on the rural producers of Bangladesh, India, Nepal and Sri Lanka by an examination of the changes which have been taking place in local markets subsequent to the initiation of liberalized programmes. The project is also looking at the extent to which rural productivity and options for diversification by rural producers have gone up due to liberalization policies.

Socio-economic dimensions of development: employment, equity and gender issues

38. An important event during the year was the UNU/WIDER Conference on "The Politics and Economics of Global Employment" held in Helsinki in mid-June. Experts from 36 countries considered international, regional, rural, technological and gender aspects of employment, together with characteristics of labour markets and the role of international organizations in building human capacities. The conference was organized by UNU/WIDER with the United Nations Secretariat for the World Summit for Social Development, the Economic Commission for Europe, the European Association of Development Research and Training Institutes, the International Institute for Labour Studies, and the World Federation of United Nations Associations. The conference was convened to focus attention and awareness on key employment issues which may be taken up at the World Summit for Social Development scheduled to take place in Copenhagen in March 1995. A report of the meeting was issued and distributed widely. The volume containing specific papers prepared for the conference is being published and will be made available to the Preparatory Committee for the Social Summit.

39. During 1994, UNU research also addressed issues related to women and development. UNU has participated in various United Nations agency consultations on women in development organized by the Division for the Advancement of Women of the United Nations Secretariat, including inter-agency meetings to prepare for the Fourth World Conference on Women scheduled to be held in Beijing, China, in September 1995. UNU researchers have submitted materials for inclusion in the 1994 World Survey on the Role of Women in Development. A UNU/WIDER project entitled: "Women, Employment and Social Policies in Industrializing and Transitional Economies" will contribute to both the United Nations World Summit for Social Development and the World Conference on Women. The project is examining economic restructuring (structural adjustment, privatization, marketization, the shift to export orientation) and its effects on women's employment, women's access to social services, and social policies and labour legislation that relate to women, work and family. Countries included in the study are China, Iran, the Republic of Korea,

Malaysia, and Viet Nam. UNU/WIDER plans to organize a workshop around the project at the time of the Beijing Conference.

40. A joint UNU/INTECH and UNIFEM project on "Monitoring the Impact of New Technologies on Women's Industrial Work in Asia" is assembling information on the impacts of new technologies on employment and entrepreneurial opportunities for women in nine countries chosen to reflect the economic and market diversity of the Asia-Pacific region: Bangladesh, China, India, Indonesia, the Republic of Korea, Malaysia, the Philippines, Sri Lanka, and Viet Nam. The information being collected focuses on four key issues: (1) changing job skill requirements; (2) decentralization and subcontracting of production; (3) health and safety; and (4) the use of new technology in networking among women's groups. A four-day workshop was held in Kuala Lumpur, Malaysia, in September. A follow-up workshop to involve government officials from the countries being studied will be held in Delhi, India, in March 1995.

41. Dissemination targets in this project include strategic women's groups with a view to enhancing their skills in advocacy and negotiating with government agencies and policy makers as representatives of industrial women workers. Reports will be prepared for presentation to national and international policy makers on the changing needs and concerns of women workers in the area of new technologies. Representatives of local women's groups will be trained in lobbying and communicating with policy makers through workshops and training manuals published both in English and in local languages. The project will also contribute to discussions at the September 1995 World Conference on Women in Beijing, China.

Global change and perspectives

42. Research continued within the UNU/WIDER project on "Restructuring the Global Military Sector - Political Economic, Social and Institutional Aspects", with a view to making recommendations to international institutions about how the restructuring process can be managed so as to prevent dangerous tendencies towards fragmentation and violence. Activities are aimed at exploring: (1) the demand side including security requirements; (2) the supply side including a perspective of the institutions, people and resources engaged in military activities; and (3) an agenda for international action. Work is continuing towards the development of new conceptual tools for understanding the interaction of military activities with the civilian economy.

43. "Global Change and Modeling" is a set of activities which aims at placing the UNU in a position to serve as a world forum on global change and structural transformation. The project was started in 1991 as a response to the acceleration and intensification of change faced by virtually all societies in the closing years of the twentieth century. The project is generating knowledge and skills necessary to help understand and manage the complex, dynamic and often non-linear system underlying a global transition towards sustainable development. In order to achieve this, the UNU has been expanding its network of global modelling groups in order to support analysis and policy initiatives on specific global development issues. The UNU global modelling network includes the Brookings Institution, Washington, D.C., the United States; the International Institute for Applied Systems Analysis (IIASA), Laxenburg,

Austria; the Institute for Economic Analysis of New York University, the United States, the Pacific Northwest Laboratories (Richland, Washington, the United States), the World Resources Institute, Washington, D.C., the United States, the World Bank, the International Monetary Fund, the Indira Gandhi Institute of Development Research, Bombay, India; the Institute of Developing Economies, Tokyo, Japan, Keio University, Tokyo and the International University of Japan, Nigata, Japan.

44. In a related effort, the UNU organized in November a workshop with a number of its network scholars to identify the theme, subthemes and a list of potential paper writers for the UNU Conference on Eco-restructuring for Sustainable Development to be held in Tokyo in 1995. This conference will be the fourth in the series of UNU conferences on Global Change and Perspectives. The Tokyo workshop also helped to formulate the long-term research effort of the UNU in the field of eco-restructuring. (See also the Programme on "Eco-restructuring for Sustainable Development".)

45. Books based on the 1992 and 1993 UNU conferences in the Global Change and Perspective series are currently in the process of publication by UNU Press. Arms Reduction: Economic Implications in the Post-Cold War Era 7/ examines global trends and patterns of military expenditure, and explores possible arms reduction scenarios and their impacts on the world economy. Global Environment, Energy, and Economic Development 8/ examines the interrelationship of the environment, energy requirements, and economic development from a long-term global perspective. The book includes a discussion of long-term strategies for economic development, particularly in developing countries, and for mitigating the negative impact of future economic development and energy needs on the global environment.

46. UNU/WIDER made a special contribution to the Global Conference on the Sustainable Development of Small Island Developing States, which was held in Barbados in April-May. Professor George Vassiliou, former President of Cyprus, prepared a paper on the socio-economic implications of tourism in small island States which was presented at the Conference. This contribution was made in response to a request from the Commission on Sustainable Development.

C. Sustaining global life-support systems

Background

47. In 1993, a high-level Advisory Team proposed a bold 10-year programme for the UNU's response to the concerns of all nations expressed at the United Nations Conference on Environment and Development, held in 1992. The "UNU Programme on Environmentally Sustainable Development" (UNU Agenda 21) suggested lines of action with three entry points, viz., eco-restructuring; integrated studies of ecosystems; and environmental governance. 9/ It also calls for UNU to work closely with UNDP, UNEP and with organizations in helping to bring the combined results to bear upon policy-making processes of the Commission on Sustainable Development, as well as on the current reflection on future United Nations functions, strategy and structures.

48. UNU's Agenda 21 is also targeted to support national and regional efforts to design, enact and implement sustainable development strategies, giving particular attention to the perspectives and needs of developing countries. The central tools for programme implementation consist of research, human resource development, and dissemination, with an emphasis on capacity-building. Human resource development, particularly in developing countries, through graduate and postgraduate training as well as curriculum development are central to the UNU approach in addressing concerns for environmentally sound development. From this perspective, UNU's work is organized within five programmes as follows:

- "The Eco-restructuring for Sustainable Development" programme seeks to generate knowledge and skills in environment, engineering, economics and energy essential for managing the transformation to sustainable development. Activities are based at the UNU headquarters and are implemented in close cooperation with UNU/WIDER and UNU/INTECH.

- The programme on "Integrated Studies of Ecosystems" brings together issues of environmentally sustainable development from the perspective of the carrying capacity of ecosystems and their ability to support, resist or recuperate from long-term impacts and transformations. It encompasses activities under ongoing programmes coordinated by the University Centre and its networks of scholars.

- "The Information Systems for Environmental Management" programme is concerned with developing the intellectual tools necessary for sound environmental management and strengthening human capacities to achieve it. The programme is primarily coordinated from the University Centre in Tokyo.

- The programme on "Natural Resources in Africa" is addressed to the need for human resource development and institution-building in key areas of renewable natural resources in Africa. The programme is implemented by UNU/INRA in Legon, Ghana, and in Lusaka, Zambia.

- "The Environmental Law and Governance" programme addresses important issues of international law and institutions related to environmental governance. Activities are carried out by the UNU Centre in Tokyo and are linked with initial academic work being taken up in the development of the UNU research and training centre on the study of governance to be located in Barcelona, Spain.

Eco-restructuring for sustainable development

49. Within this programme, a seminal volume on the original concept of "industrial metabolism" 10/ was issued by UNU Press during the spring. The volume was the end result of a UNU project which grew out of work carried out within the UNU programme on human and policy dimensions of global change. The volume is meant to serve as the standard treatise on the subject of industrial restructuring for sustainable development. Concerned with the processes and instruments by which economic activity and environmental degradation can be effectively de-linked, the knowledge contained in this study will benefit both the academic community and policy planning in the United Nations system and

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national agencies. A second UNU book on industrial metabolism which will further extend the original concept is currently in progress.

50. A step further along this line of research is the concept of "zero industrial emissions". In early July, UNU introduced the preliminary project frame for the Zero Emissions Research Initiative (ZERI) at a business round table held in Tokyo. This major new research effort is aimed at achieving technological breakthroughs which will facilitate manufacturing without any form of waste. Work during 1994 established linkages with companies, industrial policy makers and researchers in order to initiate a long-term research programme to find ways to transform current manufacturing systems into new types of production that do away with all forms of wastes and emissions. Initial efforts have involved: (1) a review of industries and re-engineering opportunities; (2) an inventory of all types of outputs used in a particular process of manufacturing; (3) preparation of output-input models to determine the best clustering of industries for zero emissions; (4) identification of breakthrough technologies required to make the industrial clusters economically viable; and (5) industrial policy advice on the design of required government policies. Industrial clusters being investigated for further study include: (1) fish farming and beer brewing; (2) sugar; (3) forestry; (4) paper and pulp industries; (5) plastics, cement and construction materials. Feasibility studies were started in late 1994 in each of the five areas and additional studies are in the process of being commissioned to identify potential uses for technologies taken directly from nature such as the use of non-colour pigments present in natural fibres and of bio-degradable waxes, and on redesign possibilities for production and operations currently involving toxic materials such as mercury. A World Zero Emissions Congress is being planned for 6-7 April 1995 in Tokyo to serve as a forum for the exchange of information and discussion on the design and implementation of a global multidisciplinary research programme.

51. Another major development in 1994 was the implementation of a postgraduate education programme in sustainable development and management under UNU Agenda 21. Through curricula development and the implementation of degree and short-term training courses, UNU aims to enhance capacity-building, particularly in developing countries, in the area of sustainable development and management.

52. A general agreement of cooperation between UNU and Keio University, Japan, was signed in March 1994. Under the agreement, both institutions are committed to develop joint research, postgraduate education and training activities. The focus of collaboration in 1994 has been the UNU-Keio University Postgraduate Education Programme in Sustainable Development and Management. In 1994, Keio University initiated an M. A. programme within the newly established Graduate School of Media and Governance at its Fujisawa campus. Keio University students enrolled in this programme are able to earn half of their required academic credits by engaging in specific research projects, including ongoing work within UNU's Agenda 21. The UNU-Keio University Postgraduate Education Programme involves both a regular lecture series and research. Students attend lectures and engage in research at Keio University's Fujisawa campus and at the UNU headquarters under the supervision of a joint faculty. The Agreement of Cooperation between UNU and Keio University also includes collaboration in the

development of a scientific database at UNU for postgraduate research and training.

53. In September, UNU renewed an agreement of cooperation with the Asian Institute of Technology (AIT) in Bangkok for a further five years under which UNU and AIT are working towards the joint organization of a short course in eco-restructuring for sustainable development, targeting mid-level planners and managers from South-East Asian developing countries. It is hoped that the first course will be organized in early 1995 and serve as a precursor to a UNU-AIT postgraduate degree programme in eco-restructuring for sustainable development. In a similar initiative, UNU is working with the Tata Energy Research Institute (TERI), New Delhi, India, on a short course in sustainable development and management to be held at TERI in early 1995. It is hoped that this early collaboration will also lead to the establishment of a UNU-supported degree programme in sustainable development and management at TERI.

54. In April 1994, UNU/INTECH organized an exploratory workshop on the Transfer of Environmentally Sound Technology. The workshop was an important UNU/INTECH contribution to the UNU's overall Agenda 21 programme. Contact with relevant parts of the United Nations system, in particular with the secretariats of the Commission for Sustainable Development, and the Commission for Science and Technology for Development, were maintained during the planning process. The workshop provided an opportunity to explore ideas for a possible research project on the topic. Papers presented at the workshop have been made available in the UNU/INTECH working papers series. The main conclusion of the discussions is that the initial efforts of UNU/INTECH should be focused on factors determining the transfer of environmentally sound technology, and in particular on the question: how do developing country policies on environmental standards and control influence the transfer of environmentally sounder technologies? A pilot project has been initiated to examine the legal framework for environmental control in a developing country and to examine the effectiveness of enforcement of environmental law.

55. Complementary to more traditional global economic modelling approaches, such as that of LINK and the Brookings Institution, UNU has initiated a network of modelling groups including the International Institute for Applied Systems Analysis (IIASA), Battelle, the National Institute of Public Health and Environmental Protection of the Netherlands (the IMAGE integrated model of climate change), and the Japan National Institute of Environmental Studies (the Eco-Asia model). The new approach is concerned with integrating the question of global warming with human economic activities. From this global network of leading scholars and research institutions, UNU has begun to form a UNU panel on scenario building for the twenty-first century. This panel will constitute a central and ongoing focus for UNU in furthering global research on sustainable development.

56. In 1994, UNU entered into a two-year collaborative arrangement with the Institute for Economic Analysis at New York University, the United States, to provide a way to bring social and demographic phenomena into the analysis of structural change. The objective is to better understand the situation of different categories of households, their present structure, and the nature of the major structural changes to which they are exposed in the wider context of

eco-restructuring for sustainable development. Indonesia is being used as a case-study. The project is committed to building a network of scholars and institutions, particularly in developing countries.

57. UNU entered into a two-year period of collaboration with Kanagawa University, Japan, in the project "Trade, Environment, and Structural Interdependency in the Asia Pacific: APEC and International Environmental Agreements". The project is examining issues of trade, environment and interdependency in the Asia Pacific region in order to provide the foundations for potential policy alternatives to resolve the conflict between economic structuring and international environmental policies and goals.

58. Together with Keio University in Tokyo, and the International University of Japan, Nigata, Japan, UNU is seeking to strengthen global eco-restructuring capability and policy formulation based on a more common analytical framework of "Green GNP". For this purpose, integrated economic-environmental accounting is being developed for and applied to a number of case-study countries. In addition, a study on natural resource consumption, industrial relocation, and the division of production activities in the Asia-Pacific region is being undertaken.

59. In a continuing effort by UNU/WIDER, the first version of a textbook Economic Analysis of Environment and Development has been completed and submitted for publication. A teaching workshop in environmental economics for lecturers in economics from universities in the Caribbean and the Central American region was held during November in collaboration with the University of West Indies, Jamaica. This is the third in a series of such teaching workshops organized by UNU/WIDER on a regional basis. A fourth such workshop in Latin America and a fifth in China are envisaged in 1995. UNU/WIDER's work is aimed at inserting the subject of environmental economics into university courses in economics taught in developing countries and encouraging local research in this area as well as sensitizing local decision makers to these issues.

Integrated studies of ecosystems

60. Since 1978, UNU has been concerned with mountain research and development. This continuing UNU programme on "Mountain Ecology and Sustainable Development "is presently focused on the management of mountain ecosystems for sustainable development, and complex highland-lowland interactive systems. Chapter 13 of Agenda 21 identifies mountains as important sources of water, biological diversity and minerals, and UNU experts were instrumental in the preparation of this portion of the Agenda 21 document.

61. Within the programme, research is currently being carried out within a study entitled: "Floods in Bangladesh: Process Analysis and Process Understanding of Case Studies in Our Century" and is meant to broaden understanding of the flooding taking place in Bangladesh and India every year during the monsoon season, and its interconnections with deforestation and soil erosion in the Himalayas further upstream. The project involves collaboration with the Institute of Geography, University of Bern, and the Swiss Development Cooperation (SDC).

62. Another study on the "Impact of Development on Socio-Economic Conditions and Environment in Minority Areas of Northwest Yunnan, China" is focusing on field research in the Hengduan Mountains of north-western Yunnan Province of China (Lijiang-Yulongxue Shan) and examining the socio-economic elements, including the role of women, of subsistence mountain agriculture in a marginal area. The project is carried out jointly with the Department of Geography, University of California, Davis, and the Yunnan Academy of Social Sciences with a grant from the Ford Foundation. Close linkages have been established with UNU's PLEC programme.

63. A major UNU focus within the area of mountain ecology and development has been on capacity-building in developing countries through the establishment of and support to regional mountain associations, including the African Mountain Association and the Andean Mountain Association. Training activities have consisted of individual fellowships for project participants from developing countries, as well as cooperation with other UNU training courses, including the annual course on Geological Risks and Natural Disasters at the University of Geneva, Switzerland.

64. UNU also cooperates in the publication of the leading journal in the field, Mountain Research & Development (now in its 14th volume); the journal is published quarterly. Important dissemination channels for research results from UNU work in this area are also directed to the United Nations system through the inter-agency process, and to the research and NGO communities through networking.

65. As was reported earlier, immediately following the United Nations Conference on Environment and Development in June 1992, UNU jointly with UNESCO, the Association of Amazonian Universities (UNAMAZ) and the Third World Academy of Sciences (TWAS) organized a conference on Environmentally Sound Socio-Economic Development in the Humid Tropics in Manaus, Brazil. 11/ UNU's South-South Cooperation Programme emanated from this activity with the objective of strengthening cooperation and mutual learning between the countries located in the humid tropical regions in Latin America, Africa and Asia in the field of environmentally sound socio-economic development. Special attention is being given to enhancing biosphere reserves and the rational use of biodiversity for the benefit of local and indigenous populations and the countries concerned. In the initial phase, 15 case-studies were commissioned. The first steering committee meeting was held at Chiang Mai University, Thailand, in May 1994 and a second such meeting will be organized in Africa, most likely in Madagascar, in 1995. Activities are being closely linked with those of PLEC. The main medium of dissemination for results from the programme is expected to be a newly established South-South Cooperation Newsletter produced by UNESCO.

66. The General Assembly designated the 1990s as the International Decade for Natural Disaster Reduction (IDNDR) to reduce loss of life, property damage, and social and economic disruption caused by natural disasters especially in developing countries. In contributing to United Nations efforts on this issue, UNU, together with the World Seismic Safety Initiative (WSSI), the International Center for Disaster-Mitigation Engineering (INCEDE) of the University of Tokyo, and Stanford University, are initiating a Global Network in Natural Disaster Risk Management (GLO-DISNET) to act as a catalyst in formulating effective

programmes to deal with the issues and global risk associated with natural disasters. The purpose of linking scholars electronically is to assist developing countries in managing risks associated with natural disasters through research, capacity-building and information. In addition to these activities, GLO-DISNET will encompass a public education function by informing the general public, local communities and NGOs of research efforts and results through electronic, audio-visual and other means. Emphasis will be put on promoting knowledge and information about risk management in relation to natural disasters through public media.

67. UNU also organized an International Conference on Natural Disasters in Mega-Cities in Tokyo, Japan, in January as part of a larger research project covering about 10 mega-cities in various parts of the world, and their preparedness plans and possible responses to natural disasters. UNU and INCEDE are jointly organizing public forums to commemorate the United Nations World Disaster Mitigation Day. The first one was organized in 1993, 12/ and the second one, with the topic "Why is Global Earthquake Risk Increasing?" by WSSI Chairman and UNU Visiting Scholar, Haresh C. Shah, took place on 12 October 1994.

68. Issues pertaining to the management of international waters figure prominently in the present UNU programme on Integrated Studies of Ecosystems. Research on "Caspian, Aral and Dead Sea Water Crisis and Perspectives" has been aimed at providing a comprehensive and objective environmental management setting for sustainable development, taking into account international political considerations and conflict resolution. State-of-the-art research papers for the Forum have been commissioned, and a long-term field research programme is being designed as a part of the present project.

69. UNU organized an International Symposium on the Regional Development of the Mekong Basin in cooperation with the GIF Research Foundation Japan in Tokyo, in December. Through the symposium UNU sought to contribute to the process of formulating a new framework for the development of the Mekong River Basin, including international cooperation and aid. The immediate objectives were to initiate discussions to identify the needs for integrated and sustainable development in the region, including the management of water resources and the development of transportation and other infrastructure. The symposium also served to define the required support in the form of ODA and other international cooperation to achieve these goals.

70. A UNU/WIDER project: "The Forest in the South and the North: Transition from Deforestation to Sustainable Forest Policies in Redressing Global Warming," was started in June with an initial planning meeting and is expected to provide a useful contribution towards implementing the international conventions on climate change and bio-diversity - two of the notable achievements of the United Nations Conference on Environment and Development. This project is making a quantitative analysis of forestry resources use in the South and the North focusing on forests as greenhouse gases sinks and the role they can play in the international convention on climate change. The project involves two institutions in Finland: the Finnish Forest Research Institute and the European Forest Institute, as well as the Instituto de Pesquisa Economica Aplicada, Rio de Janeiro, Brazil, for a sub-study on the Brazilian Amazon.

Information systems for environmental management

71. UNU continued to carry out two projects related to environmental monitoring and analysis during the year. Within the project on "Coastal Marine Pollution Monitoring and Training: Asia Pacific Mussel Watch", UNU is seeking to analyse and monitor key hazardous chemicals and substances in the coastal marine areas of the Asia-Pacific region, including relative levels of important agricultural and industrial halogenated hydrocarbons in the eastern Pacific. The project is also ascertaining whether or not these compounds jeopardize marine organisms or public health from the consumption of foods from the sea.

72. Complementary to this effort is a UNU research initiative to monitor and analyse substances other than those pertaining to coastal marine pollution. Substances to be analysed include river sediment, atmospheric particulate material, industrial waste, foodstuffs, human hair and water (synthetic solution). It shares the general objectives Asia-Pacific Mussel Watch project, however, under the present project, participating laboratories will be given training and support to encourage the development of their own certified reference materials for each substance analysed. Within this field, UNU organized in June an International Symposium on Environmental Management and Analysis of Hazardous Chemicals. The symposium brought together high-level scientists from eight Asia-Pacific countries, Japan and the United States to exchange information on the state-of-the-art in chemical analytical techniques. Held back to back with the symposium was a UNU workshop on "intercalibration of analysis and monitoring of hazardous chemicals".

73. The UNU/WIDER project on "National Environmental Policies - A Comparative Study on Capacity Building" was initiated in September. Twelve to 15 case-studies have been commissioned in which social scientists will describe and analyse the national environmental policy of a country according to a set of detailed questions. The data bank of the Environmental Policy Research Unit (Forschungsstelle für Umweltpolitik (FFU)) is cooperating in the study by providing participants with appropriate comparative statistical data.

Natural resources in Africa

74. In December 1993, the main centre of UNU/INRA, which coordinates UNU activities within this area, moved from its temporary base in Nairobi, Kenya, to offices made available by the Government of Ghana and the University of Ghana at the University campus at Legon. Considerable difficulties were encountered in establishing and operationalizing the offices in Ghana. By fall, the staffing of the offices had been essentially completed, but delays in getting the UNU/INRA office fully operational and linked by international communication connections made it necessary to postpone most of the conferences, training courses and workshops planned for 1994.

75. Some progress was made during the year, however, in purchasing equipment for the mineral resources unit located within the School of Mines of the University of Zambia in Lusaka. Purchase of this equipment was made possible by a grant from the OPEC Fund, and specifications for the equipment, books and laboratory equipment to be procured from the final instalment of the grant were essentially complete by the end of the year.

76. Altogether 43 field surveys have been conducted by UNU/INRA involving researchers and institutions in Benin, Burkina Faso, Cameroon, Congo, Guinea, Ethiopia, Ghana, Kenya, Mali, Niger, Nigeria, Senegal, the United Republic of Tanzania, Uganda, Zambia and Zimbabwe, and 41 of the reports have been revised and returned for final revisions. Twenty-two reports have been completed and selected surveys will be published in early 1995.

77. Several of the field surveys have shown that indigenous African food crops are being neglected and with the greater attention given to major, largely introduced staples, these crops are becoming increasingly underutilized. It has also been found that planting materials of indigenous African food crops are hard to come by and since some of them have not been fully domesticated, habitat destruction is contributing to genetic erosion and extinction. Very little serious conservation and evaluation of germplasm of indigenous food crop plants is taking place on a routine basis in African countries and very limited documentation of their uses and ethnobotanical importance has occurred since the 1960s. Limited use is being made in commercial eating places of these indigenous African food crops with the exception of yams in the humid tropical zone of West Africa, sorghum, finger millet and millet in the moist savanna belt and millet and cowpeas in the dry savanna and Sahelian zones. Furthermore, the surveys have found that some plants which are of limited use in their areas of highest genetic diversity are suffering rapid rates of loss of biodiversity and are threatened with extinction since sometimes they have only found uses that enhance their conservation and improvement in areas possessing lower levels of biodiversity.

78. Other field survey findings indicate that the highly weathered soils of low inherent fertility that are widespread in tropical Africa have become increasingly degraded and of declining productivity under increasing population pressure and intensity of cultivation. It is obvious from the surveys that there is no active development in Africa of integrated land-use plans and comprehensive soil conservation system programmes. Furthermore, research in this area within African universities is negligible and highly fragmented.

79. The field surveys on water resources have shown that very low levels of research of very limited scope are ongoing in African countries. Effective programmes are, however, being launched to satisfy the multiple use needs for water, especially that of drinking water in homes and to improve the quality of available supplies. On the other hand, however, water pollution is widespread and statistics on its magnitude, causes and effects are meagre.

80. The field surveys on mineral resources in five African countries have indicated that there are major deficiencies in endogenous trained human resources and institutional capacity for mineral exploration and limited capacities for generation and use of appropriate technologies for small-scale mining operations. There are also serious deficiencies in policies and legal instruments that support the mineral industry and a lack of local capabilities for mineral-based manufacturing industries that can ensure increasing benefits accruing to African countries from value added export. The surveys have also found that there are negligible resources and efforts being devoted to research and programmes for rehabilitation of environmentally degraded mined sites and to combating environmental pollution resulting from mining.

81. While progress in finishing the field survey phase of UNU/INRA's work has not proceeded at the pace originally envisaged, it is hoped that new project activity can be initiated early in 1995. 1994 was, however, a year in which UNU/INRA was able to relate to two other UNU efforts, viz., Population, Land Management and Environmental Change and UNU's INFOODS project.

Environmental law and governance

82. A UNU workshop on the Teaching of International Environmental Law was held in June in Barcelona, Spain. The purpose of the workshop was to define the shape and direction of future UNU activities in the field of teacher training in this area. Workshop recommendations included the development of "teacher packages" which may be used for academic faculty to teach international environmental law. Training and capacity-building utilizing the approach of "training the trainers" is being emphasized by UNU in this field. Another workshop on "Compliance, Implementation and Enforcement of International Environmental Legal Accords" was held in Barcelona in September. Utilizing the results of the workshop, plans have been made for a UNU Global Training and Education Workshop on International Environmental Law to be held in Barcelona in June 1995. The workshop brought together some 20 participants who are active in the field of compliance, implementation and enforcement of environmental legal accords, including academics, international lawyers and United Nations officials.

83. The workshop reflected upon and explored the extent to which international environmental law - both "soft" and "hard" - is presently being implemented. It also closely examined the various means available for collective enforcement, including inducements and other tools that are and may become available to the international community for this purpose.

D. Advances in science and technology

Background

84. The UNU's work within the programme area: Advances in Science and Technology is directly concerned with the impact of science and technology in the process of development. Activities are undertaken within four programmes which are directed towards examining the implications for new technologies in providing solutions to socio-economic problems and other obstacles to more equitable human development.

- The first programme: "Socio-economic implications of new technologies" is concerned with the political and socio-economic impacts of new technologies and of national technology policies. Most of the UNU's efforts in this area are carried out by UNU/INTECH in Maastricht.

- A second programme: "Applications of biotechnology for development" is presently a regionally focused set of activities aimed at building capacities in developing countries to harness the potential of biotechnology for producing food of sufficient quality and quantity,

for providing inexpensive and sustainable sources of energy and for improving human health and overall quality of life. The coordinating location for these activities is UNU/BIOLAC in Caracas, Venezuela.

- A third programme dedicated to "Software technology for developing countries" is carried out by UNU/IIST in Macau. These efforts are aimed at transferring technology through research and training. Through a concentrated set of capacity-building activities, UNU/IIST conveys research methods to researchers, university curricula and course topics to university lecturers, and software development methods to researchers, lecturers and industry software engineers.

- The fourth programme: "Microprocessors and informatics" involves the provision of postgraduate training through regional and subregional training workshops, strengthening the capacities of selected institutions to serve as centres of teaching and research in informatics, and promoting the application of university research to industry and business.

Socio-economic implications of new technologies

85. During the year, UNU/INTECH study continued to explore the process of industrialization from a perspective involving institutional innovation and technologically grounded market failures. The study entitled: "Industrialization Strategy and Policy from a Technological Perspective" places technological development at the centre of the industrialization process. This framework leads to a better analytical structure than has previously been available and may reveal new insights into the process of industrialization. The study is based on a review and synthesis of published literature and data and is devoted to constructing an empirically grounded analytical framework. Selected researchers have been interviewed to gauge emerging trends and to probe various theories about the technological successes of the newly industrialized countries (NICs) of Asia. Several studies have been commissioned to survey and tabulate data on topics relevant to emerging trends in industrialization and technological development. Work during 1994 mainly involved the preparation of the research monograph which is expected to be ready for publication in mid-1995.

86. During 1994, the results of several field studies prepared in six developing countries became available within the UNU/INTECH project on "New Technologies, Economies of Scale and Scope and Location of Production in Developing Countries". Draft research findings were examined by a group of leading scholars and experts in engineering, economics, management, history and sociology from developed and developing countries specialized in the topic during a workshop held in Maastricht in September. Case-studies for firms in the mechanical engineering industry in Brazil, India, Mexico, Thailand, Turkey and Venezuela were discussed and analysed. The main conclusions were that the diffusion of microelectronics-based control systems and production and design equipment in these countries was larger than expected and that it was accompanied by new forms of production organizations which in a few cases were more advanced than in equivalent firms in developed countries. The research also concluded that capital requirements of the new technologies were much

larger than that for previous vintages of equipment which increases the level of plant output necessary to reduce unit costs, and, that while product knowledge and marketing requirements had increased with the new technologies, there had also been a reduction in the need for administrative and managerial functions and as a result no firm judgement could be made regarding changes in firm scale. The workshop discussions led to the revision of several studies based on the inputs received during the workshop, and the first draft of the edited volume with the various country studies, overall conclusions and implications and policy recommendations was expected to be available by year's end.

87. Additional project funding became available during 1994 to incorporate several additional researchers within a UNU/INTECH project on "Import Liberalization, Industrialization and Technological Capability in Sub-Saharan Africa". Country studies in Côte d'Ivoire, Ghana, the United Republic of Tanzania and Zimbabwe continued, in which individual firms are being surveyed using a standardized questionnaire to assess the impact of national trade policy on individual firms, technological learning, growth in productivity and export performance. Three sectors are being examined: textiles, light engineering and a third sector specific to each country. The retrospective direction of the project in assessing firm history during the 1980s in terms of output, exports, employment, use of imports, competition from imports, growth of technological capability will help to assess the success of national trade policies in supporting improved efficiency and the development of technological capabilities.

88. Project development initiatives continued in 1994 on a UNU/INTECH project on "Export Competitiveness in Post-apartheid South Africa" which carries forward a recently completed study of industrial strategy for post-apartheid South Africa. The project frame calls for an exploration of the sources of local and foreign technology in the main industrial branches, and the patterns of in-firm technological capabilities. State-controlled research and development institutes under the Council for Scientific and Industrial Research (CSIR) will also be examined. The study is expected to specify technology policies required in the main industrial branches in support of export promotion in the manufacturing sector. During 1994, UNU/INTECH collaborators provided advice on the development of the project and a methodological course for the conduct of firm-level studies of technological capabilities. UNU/INTECH resources will be used primarily to provide international research advice for South African researchers.

89. UNU/INTECH also extended the scope of an ongoing project on new enterprise organizations derived from China's state-sponsored research and development institutes. The study entitled: "Evolution of High Technology Research Institutes and New Enterprise Organizations in China" is attempting to trace the initiation and growth of these organizations; to assess their role in commercializing technological know-how and to document factors that fostered or constrained their success and growth. Efforts in 1994 involved field work in China and will continue to involve a review of data on these enterprises in China, and a number of case-studies of individual research institutes and enterprises. Preliminary research findings were reviewed at a workshop held in Maastricht in late June and early July. Project results will be issued in working paper and journal article form as project work continues into 1995.

90. A project on "Patterns and Trends in Technology Licensing and Foreign Direct Investment: Empirical Studies of Their Determinants" being carried out by UNU/INTECH is analysing the emerging trends and patterns in technology transfer involving licensing and foreign direct investment by multinational enterprises, particularly in developing countries. Several studies were commissioned within the project during the year and preliminary results from the research are expected to become available in the form of working papers in early 1995. The aim of the study is to identify external factors to individual firms which influence patterns of technology transfer. Contacts are being developed with various international agencies, such as the United Nations Conference on Trade and Development (UNCTAD), the United Nations Industrial Development Organization (UNIDO), the World Bank, the IMF, the Organization for Economic Cooperation and Development (OECD) and its Development Centre so as to ensure that UNU/INTECH efforts in this area complement related work in these organizations. Related to this project is a workshop on "Foreign Direct Investments, Economic Structure and Governments" organized jointly with the Erasmus University of Rotterdam which was held in mid-December.

91. An externally funded project on "New Technologies and Research and Development Systems in Southern Europe" undertaken at UNU/INTECH seeks to assess European Community and national technology policy, including, in particular, the question of relations of the national research and development systems to relatively weak industrial systems. The study is examining the mobilization of technological capabilities in the formal (mainly state) research and development systems in Greece, Portugal and Spain. Project activities have been extended to consider additional aspects of technology policy in southern European economies. Research findings are expected to provide a valuable bridging function between the policy concerns of the larger, more industrialized European economies and the problems of developing countries.

92. UNU Press also issued during 1994 a UNU/INTECH study entitled Technology and Innovation in the International Economy. 13/ The book contains extensive and detailed essays on two key areas of technological innovation: micro-electronics and biotechnology, and the impacts which these technologies have on production, trade, employment, and welfare in developing countries.

Applications of biotechnology for development

93. The UNU Brucellosis Research Network, part of the UNU/BIOLAC programme, continued to make progress towards its goals of carrying out multi-centred, coordinated research in the development of a vaccine against brucellosis and effective diagnostic methods for the disease in humans as well as livestock, and promoting scientific exchanges among scientists working on brucellosis within Latin America and outside the region. At the annual workshop held at the Instituto Nacional de Diagnostico y Referencia Epidemiologicos (INDRA) in Mexico City in March, the progress made within the project on the "Study of Vaccination and Treatment against Brucella spp" was presented by each of the investigators involved in the project. A total of 19 network members from laboratories in Argentina, Chile, Colombia, Ecuador, Mexico, Peru and Venezuela, and advisers from Canada and the United States attended the workshop.

94. UNU/BIOLAC continued to promote academic exchanges throughout Latin America by providing fellowships for research training and organizing two-week courses at the leading biotechnology institutions within the region. A total of 18 individual fellowships ranging in duration from 3 to 12 months were awarded during the year.

95. A two-week training course on the Molecular Basis of Tumor Growth Control, Differentiation and the Cell Cycle was organized in the Laboratory of Tumor Cell Biology of the Instituto Venezolano de Investigaciones Cientificas (IVIC) in Venezuela in late January. The intensive course consisted of lectures by the staff of IVIC and invited experts from abroad and of laboratory exercises. Twelve participants of whom seven were from outside Venezuela received instruction on the latest knowledge on growth control using inducers of differentiation and antisense oligonucleotides; and the role of cyclins and protein kinases in cell proliferation. The course also acquainted the participants with emerging concepts regarding diagnosis and identification of targets for therapy in carcinogenesis.

96. Another two-week course on the Application of Biotechnology for Protection of Crops Against Diseases and Pests took place in Cuernavaca, Mexico, as a collaborative activity between UNU and the Universidad Nacional Autonoma de Mexico (UNAM) in October. The course consisted of lectures on the latest developments in bioinsecticides and laboratory exercises on their various applications in crop production.

Software technology for developing countries

97. The longer-range aim of the projects on UNU/IIST's "railway computing systems", of which "The People's Republic of China Railway Computing System" is the first, is that railway systems of developing countries become front-of-the-wave internationally competitive in the use and development of railway software while at the same time relying on extensive computerization to make domestic railways significantly more efficient thereby also allowing increased investments. Fellows, staff and visiting scholars worked together on a daily basis within "Master classes" - considerable understanding of the railway problematique has been achieved and some experimental software developed. Issues such as geographically widely-distributed "train dispatch", the use of running maps for train traffic rescheduling and station management are being researched and developed.

98. A major UNU/IIST initiative on "Manufacturing Industry Information and Command Interfaces" recognizes the industrial development difficulties of developing countries, as well as the increasing reliance of manufacturing industry operations and product and process development on advanced information and communication technology. UNU/IIST work is investigating how information technology can be best applied to support small and mid-sized manufacturing enterprise development. The approach takes account to the extent possible of social, technical, organizational, economic and environmental concerns. The project is being implemented in collaboration with UNIDO.

99. The UNU/IIST research project on "Design Techniques for Real Time Systems" aims at investigating formal techniques for the development of real-time systems

so that these techniques share a unified foundation. The project has investigated duration calculus-based formal techniques in depth and achieved quite impressive results on various aspects of real-time system design, including specification, refinement, scheduling and dependability. About 10 reports (in various states of readiness) have been produced and so far four of them have appeared in international journals or within symposium proceedings. To ensure that research continues to be relevant to applications, the project is deepening its research objects from real-time systems to hybrid systems where discrete and continuous computations co-exist and interact with one another.

100. A number of seminars were held at Macau, the host location of UNU/IIST, involving participants from China, Democratic People's Republic of Korea, Hong Kong, India, Indonesia, Japan, Macau, Malaysia, the Philippines, Thailand, the United States and Viet Nam. Thirty-five students from the University of Macau also participated in a 14-week M. Sc. course on formal programming techniques. UNU/IIST also provided thesis advice to B. Sc. students of the University of Macau's Faculty of Science and Technology during the period under review.

101. A series of "off-shore" training workshops presented front-of-the-wave computing science research and programming methodological, design calculi-oriented theories and techniques. The workshops have been co-organized with leading research institutes, university computer science departments or centres and/or leading information technology industry sites - which hopefully will become future long-range collaborators. Workshops were held at the State Commission of Science and Technology in Pyongyang, Democratic People's Republic of Korea, the De La Salle University and the University of the Philippines, Manila, the Philippines, and the University of Indonesia in 1994. Additional UNU/IIST project-related workshops were held in Beijing, Berlin, Jakarta, Macau and Manila.

Microprocessors and informatics

102. An International Workshop on Parallel Processing and Applications to Physics, Chemistry and Material Science was held at International Centre for Theoretical Physics (ICTP) in Trieste, Italy, from 5 to 23 September. A total of 60 participants selected mostly from institutions in developing countries attended the training workshop to which 25 resource persons were invited to give lectures and practical demonstration of applications of parallel processing.

103. The Third College on Microprocessor-Based Real-Time Control: Principles and Applications in Physics was held from 26 September to 21 October to familiarize the participants with the use of the facilities of a real-time operating system in designing and implementing computer control of experiments. The college drew an attendance of 60 participants, and a total of 24 resource persons were involved in the lectures and practicals.

104. The Third Course on Basic Very Large Scale Integration Design (VLSI) was held from 21 November to 16 December at the Microprocessor Laboratory in the ICTP in Trieste. The course was originally set up to accommodate a maximum of 30 participants because of limited equipment. However, demand for participation in the course was so high that ICTP and the Italian Institute for Nuclear Physics (INFN), the co-sponsors of the Microprocessor Laboratory, decided to

purchase additional equipment in order to increase the number of participants to 60.

105. UNU support for the strengthening of the Computer Science Department of the University of Yaounde (UY) as a regional centre of excellence continued during this year under the framework of the Agreement of Cooperation between UNU, the University of Yaounde and the Institut National de Recherche en Informatique et Automatique (INRIA), France. This cooperation was initiated in 1984 and a few years later the University of Yaounde was able to start a postgraduate programme in computer science. UNU's support is used to invite guest lecturers from abroad for giving intensive courses of up to two weeks' duration in the various specialized areas of computer science at the University of Yaounde and to enable selected professors from the University of Yaounde to give two-week courses at other universities and research centres in West and Central Africa. During the year, a record number of 11 courses with a total combined duration of 19 weeks were given by guest lecturers from France (with additional support provided by or through INRIA), Gabon and Senegal at the University of Yaounde. In addition, three staff members of the University of Yaounde each gave a two-week course at institutions in Senegal and Zaire.

106. The Second African Conference on Research in Computer Science (CARI '94) was held in Ouagadougou, Burkina Faso, from 12 to 18 October. This conference, like the first one that was held in Yaounde in 1992 (CARI '92), was organized under the framework of the UNU/UY/INRIA Agreement of Cooperation mentioned above. Financial support for the conference was obtained from the French Ministry of Cooperation and Development, INRIA, L'Institut Francais de Recherche Scientifique pour le Developpement en Cooperation, UNU, the University of Ouagadougou, the Association of Universities in French-speaking African countries (AUPELF-UREF), Programme Intergouvernemental d'Informatique (PII) of UNESCO and the Centre International de Mathematiques Pures et Appliquées (CIMPA). A total of 275 participants drawn from African countries, Canada, France, Germany, Italy, the United Kingdom and the United States (all in all 24 countries) attended the conference. A total of 55 scientific papers were presented in the various sessions of the conference. Presentation of about 20 additional papers was made. A special session that considered the computer research situation in Africa was chaired by the Coordinator of the UNU Programme on Microprocessors and Informatics, Dr. Ines Wesley-Tanaskovic.

107. The Second Workshop of the UNU-Irish Microinformatics Project with the title, "Towards a Programme for the Development of Microinformatics Applications in Africa" was held in Kampala, Uganda, from 11 to 14 April. The workshop helped to create an understanding of the issues underlying the transfer of academic research and development into marketable processes, products and services using the experiences of Irish universities. It examined ways of promoting technology transfer through cooperation between universities and the industrial sector. The workshop was attended by Irish experts, representatives of UNU and the Higher Education for Development Cooperation (HEDCO) and most of the former UNU fellows who received training under the project in Ireland. As the last activity of the Second UNU-Irish Microinformatics Project, two short-term fellowships were awarded in the autumn. The Second UNU-Irish Microinformatics Project was concluded in accordance to schedule, and the final

report was submitted to the Government of Ireland which provided the funds for the three-year project.

108. In a related UNU activity, the University, in collaboration with the International Information Science Foundation and the Association for Computer Machinery of Japan, organized the International Symposium on "Computers as Our Better Partners" at UNU Headquarters Building in March. The symposium focused on developments related to the use of computers to assist people with disabilities. The Coordinator of the UNU Microprocessors and Informatics Programme, and Professor Dines Bjørner, the Director of UNU/IIST, participated in the symposium and presented papers.

E. Population dynamics and human welfare

Background

109. The United Nations organized the International Conference on Population and Development in Cairo, Egypt, in September, in part to heighten public awareness of the consequences of rapid population growth on the overall human condition. UNU has for several years been engaged in research activities which address critical elements of population growth and demographic shifts and their impact on human development and welfare. Three programmes are undertaken within this theme:

- The first programme: "Population, urbanization and development" examines the implications of population growth and structure, urbanization trends, and international migration and the resulting socio-economic consequences for unemployment and poverty, particularly in the developing countries.

- The second programme: "Population, land management and environmental change (PLEC)" investigates the consequences for land management, hence for the environment, of continuing population growth at global, regional and local scales.

- A third programme: "Food and nutrition for human and social development" comprises a long-standing commitment by UNU to address major nutrition problems of developing countries and to strengthen the capacities of developing countries to confront national food, nutrition and health problems.

Population, urbanization and development

110. A project on "Mega-Cities and Urban Development" initiated in 1990 is examining the growth of large metropolitan agglomerations, especially in the developing world, in regard to the patterns and projections of their growth and their social, economic, and environmental consequences.

111. An overview volume on the challenges presented by mega-city growth prepared by scholars and planners was issued in 1994. 14/ This book emanates from an international UNU meeting on the "Mega-City and the Future" that called for a

more vigorous research agenda on a regional level. Additional volumes prepared on a regional basis are in various stages of preparation. The Asian volume 15/ is nearing the publication stage and focuses on emerging urban systems and the impact of global restructuring on Asian-Pacific cities including Bangkok, Hong Kong, Jakarta, Seoul and Singapore, and coastal cities in China. A special volume on Tokyo 16/ focuses on the Japanese mega-city experience and is in the final editing stage.

112. The Latin American volume 17/ focuses on current socio-economic transformations and specific urban-related issues such as the special housing problems and transportation needs in Latin American cities including Lima and Mexico City. Review meetings within the project have been completed, and the manuscript has reached the final editing stage.

113. The Africa volume 18/ assesses the policy implications of present patterns of urban growth and explores emerging urban management issues in African cities including Cairo, Johannesburg, Kinshasa, Lagos and Nairobi.

114. These five volumes on mega-cities will form the basis of a UNU contribution to the City Summit, the second United Nations Conference on Human Settlements (Habitat II), scheduled to be held in Istanbul, Turkey, in June 1996.

Population, land management and environmental change

115. UNU's Population, Land Management and Environmental Change (PLEC) programme addresses the interrelationships between population dynamics, environmental change, and biodiversity/agrodiversity conservation. It seeks to examine and disaggregate the processes of adaptation of resource management systems and land use through a series of field-based research projects in key agro-ecological zones of tropical and sub-tropical environments. Field research clusters have been established and are operational in: (i) Amazonia (based at the Brazilian Enterprise for Agricultural Research (EMBRAPA), Belem, Brazil); (ii) Ghana (based at University of Ghana, Legon); (iii) Eastern Africa (based at the Kenya Agricultural Research Institute, Nairobi, Kenya, in cooperation with the National Agricultural Research Organization and Makerere University, Kampala, Uganda); (iv) Northern Thailand-Yunnan province of China (based at Chiang Mai University, Thailand, and the Kumming Institute of Botany, Yunnan, China); and (v) Papua New Guinea (based at the University of Papua New Guinea, in cooperation with the University of Tokyo, Japan, and the Australian National University). A sixth cluster now in formation will be set up in the Caribbean based at the University of the West Indies.

116. The first general meeting of the PLEC programme was organized in Chiang Mai, Thailand, during 30 May-4 June. The meeting brought together the coordinators, scientific advisory group members and key individuals from all clusters to discuss progress of the field research and to formulate future plans. The meeting also included field work in a hill tribe community.

117. A regional workshop on Environment, Biodiversity and Agricultural Change in West Africa was held in Legon, Ghana, during 25-27 October 1994. Hosted by UNU/INRA in cooperation with the Department of Geography and Resource Development of the University of Ghana, the meeting reviewed research carried

out under the programme in the transitional savanna zone of Ghana, devised plans for expansion of the cluster into other West African countries, and established linkages between the work of UNU/INRA and PLEC.

118. PLEC News & Views is a bi-annual newsletter currently distributed to a targeted audience of some 150 scholars and scientists working in related fields. Research results from the first year of the programme will be edited into a special supplement to the UNU journal Global Environmental Change: Human and Policy Dimensions (No. 2, 1995).

Food and nutrition for human and social development

119. In 1994, UNU's "Rapid Assessment Procedures (RAP)" project continued to provide inputs into designing, evaluating and improving nutrition and health-related programmes, and many local RAP training workshops continue to be held. A RAP workshop was organized in Praia, Cape Verde, from 23-27 May by the local UNICEF office. Twenty-seven individuals from the ministries of Health, Education, and Rural Development as well as NGOs and United Nations organizations (UNDP, WHO, UNICEF) participated in the workshop. A similar RAP training workshop was held in Senegal in November.

120. At the Administrative Committee on Coordination Subcommittee on Nutrition (ACC/SCN) meeting in New York held in March, Dr. Nevin Scrimshaw, Director of the Programme, and Dr. Fernando Viteri, Chairman and Executive Secretary respectively of the Group for Control of Iron Deficiency (GCID) presented an update of the programme and pertinent advances taking place in the control of nutritional anaemias and iron deficiency. UNU has been assigned responsibility to coordinate GCID under the aegis of the ACC/SCN. Drs. Scrimshaw and Viteri organized a half-day meeting of GCID on behalf of the United Nations and bilateral agencies. All of the concerned agencies presented reports of their iron-related activities. A summary report of the meeting was presented at the subsequent ACC/SCN meeting.

121. A workshop was held within the project on "International Dietary Energy Consultative Group (IDECG)" from 31 October to 4 November at the London School of Hygiene and Tropical Medicine to discuss position papers prepared within an initiative to update selected parts of the 1985 FAO/WHO/UNU report on energy and protein requirements. The revised papers and the recommendations of the workshop participants will be published and will form the scientific basis for an FAO/WHO/UNU Consultation in 1995.

122. The IDECG workshop on protein energy interactions showed that there are still major gaps in our understanding of the metabolic basis of protein and indispensable amino acid (IAA) requirements of the human organism in general and of the young child in particular. A research protocol to investigate these issues has been developed, and the Nestlé Foundation has agreed to fund the study.

123. The current year has been the most active and successful in the UNU "International Network of Food Data Systems (INFOODS)" project's 10-year history. In March of this year, FAO and the University organized an international discussion on "Food Composition for Developing Countries" in

Tunis, Tunisia. At this meeting the Director of the Nutrition and Food Policy Division of FAO affirmed FAO's commitment to join UNU in the promotion of the INFOODS Project and to share the tasks of completing the global INFOODS network and mobilizing resources for improving the quality, quantity, and accessibility of food composition data in the developing world.

124. The INFOODS secretariat has been transferred to the offices and laboratories of the New Zealand Institute for Crop and Food Research, Palmerston North, New Zealand. Provisional food composition tables have been completed for the Western Pacific, Central America and Chile. The former will be expanded by the Instituto de Nutrición de Centro America y Panama (INCAP) to include the Caribbean, and the Instituto de Nutrición y Tecnología de los Alimentos, Universidad de Chile (INTA) will produce a table for Latin America. However, it will be the availability of complete and continually updated data stored and accessible electronically that will be most important. The regional INFOODS data centre in the Institute of Nutrition, Mahidol University (INMU), Thailand, continues to function well, and its database is also being expanded to cover all of the ASEAN countries.

125. With support from the International Development Research Centre (IDRC), Canada, UNU convened a meeting in October jointly with FAO at the Department of Nutrition and Food Science (DNFS) of the University of Ghana, Accra, Ghana, which is a UNU-associated institution. The meeting also brought together UNU scientists working within the Food and Nutrition for Human and Social Development programme with their UNU/INRA colleagues and with those persons working in the Joint AAU/UNU Regional Food and Nutrition Project for Africa. The meeting supported the establishment of subregional databases at the DNFS, Ghana, and the Institute of Nutrition and Family Health of the University of Zimbabwe for Anglophone West and East Africa, respectively. The Food and Nutrition Research Institute in Tunis offered during the meeting to host an INFOODS centre for the five countries of North Africa.

126. To complete the INFOODS global network in developing countries, discussions were held with the American University in Beirut (AUB) that is organizing ARABFOODS. Similar discussions progressed with the Nutrition Section of the Planning Commission in Islamabad, Pakistan, that has offered to organize SAARCFOODS for South Asia, and with the Institute of Nutrition in Beijing, China, that expects to include food composition information from the Koreas and Taiwan in its regional database.

127. EUROFOODS, based in the UNU-associated institution, Wageningen Agricultural University in Wageningen, the Netherlands, has been an active collaborator and participant in the Accra, Rome and Tunis meetings. Although the INFOODS secretariat at MIT served some of the functions for the North American region, no regional INFOODS centre for North America has yet been established. The food composition database of the United States Department of Agriculture (USDA) in Beltsville, Maryland, the United States, is the largest and most used in the world, but it has not been electronically accessible. USDA has now agreed to adopt the INFOODS data tags (WHTR-14/UNUP-734) and to serve as the secretariat for NOAFOODS to include Canada, Mexico and the United States. The endorsement of the INFOODS system by FAO and its adoption by USDA are important steps to

making possible the interchange of food composition information among all countries.

128. The objective of UNU's "International Food Intake Data (INFID)" project which is complementary to INFOODS is to assist developing countries in summarizing all dietary intake data for the past 30 years and to maintain hard copies available for photocopying by anyone who desires to use them. In the current year, reasonably complete data summaries have been received and coded from Tanzania. Remaining summaries from Argentina, the Caribbean and Oceania, as well as Bolivia, Brazil, Bulgaria, China, Cuba, Ecuador, Ghana, India, Japan, Kazakhstan, Kenya, Nepal, Pakistan, Saudi Arabia, Senegal, Tunisia and Zimbabwe, were being awaited at year's end.

129. UNU developed the funding proposal, provided technical backstopping for the project "AAU/UNU African Regional Food and Nutrition Project" and played an active role in the Management Group of the Project. The project was concluded in 1994 and its activities were reviewed at a workshop held in Abidjan, Côte d'Ivoire, in April 1994. An external evaluation of the project was conducted by the Food Studies Group of the University of Oxford. It is hoped that the European Union will approve an additional grant for extending the activities of the project.

III. BUILDING CAPACITIES: POSTGRADUATE EDUCATION

130. The Advisory Team for the UNU Programme on Environmentally Sustainable Development recommended in its final report that human resource development should constitute an integral component, and indeed the most immediate target of the activities of UNU's Agenda 21. The Advisory Team urged that training under the programme should give emphasis to: curriculum development for teaching in institutions of higher learning, both at the undergraduate and postgraduate levels; the introduction of integrated environmental sciences or environmental management as new courses to be given at the postgraduate level; and mid-carrier training of managers, executives, professional civil servants and international officials.

131. While efforts are continuing to develop specific activities in all of the above priority areas of capacity-building under the UNU Agenda 21 and to mobilize the extrabudgetary funds that will be needed for them, one noteworthy development during 1994 has been the initiation of a cooperative postgraduate programme in the area of eco-restructuring for sustainable development between UNU and Keio University in Japan. Under this programme, postgraduate students registered in Keio University are able to receive half of their academic credit by engaging in specific research projects developed under the UNU Agenda 21. Other modalities of training that will be employed in the future include short itinerant seminars, guest lectureships for strengthening developing country institutions and workshops on curriculum development. It is intended to extend this cooperative activity to include institutions in developing countries. To this effect, discussions are under way to involve the Asian Institute of Technology (AIT) in Bangkok, Thailand, and the Tata Energy Research Institute in New Delhi, India.

132. In another capacity-building initiative, a workshop on the Teaching of International Environmental Law and Institutions was held in June in Barcelona with the support of the Generalitat of Catalunya in Spain. The workshop which was attended by experts in the area including a representative of UNEP agreed on the broad outlines of a series of courses that UNU plans to offer at global and regional levels in cooperation with UNEP and other organizations.

133. In yet another new development, agreement has been reached between UNU and the Department of Science and Technology of India for a cost-shared fellowship scheme that will provide 45 months of fellowships for advanced training in solar energy utilization at Anna University in Madras, India. Under the terms of the agreement, UNU will cover the cost of international round-trip air travel and insurance of the five fellows who will participate in the nine-month course whereas all local expenses for the fellowships including stipend will be met by the Department.

134. The annual one-week Global Seminar drew over 100 participants consisting of Japanese and international students studying in Japan. The theme for this year's seminar was "the United Nations Towards the 21st Century". A regional training workshop focusing on conflict resolution and ethnicity issues in Eastern and Central Africa was organized in Kenya in June in collaboration with the International Alert and the Nairobi Peace Initiative. The 10-day event was attended by 24 participants selected from the region on the basis of their active involvement in the issues pertaining to the workshop.

135. In 1993, the Japan Foundation for the Support of the United Nations established a fellowship programme in honour of United Nations Secretary-General Boutros Boutros-Ghali, which was announced during the Secretary-General's visit to Japan in February 1993 for the inauguration of the new UNU headquarters building. The Rector of UNU served as a member of the Selection Committee for the fellowships in 1994. At the request of the Foundation, UNU played a key role in the identification of candidates for the fellowships using its networks of scholars and institutions. A list of candidates drawn up on the basis of recommendations made by the Directors of UNU research and training centres and programmes and academic officers was presented to the Selection Committee which approved five individuals as awardees for the 1994 Boutros Boutros-Ghali fellowships.

136. During the year, a total of 80 fellowships were awarded for training in UNU research and training centres and associated and other cooperating institutions. With 81 fellows completing their training during the course of the year, the total number of former UNU fellows now stands at a little over 1,300. According to the workplan for 1994, it was anticipated that about 100 fellowships with a total duration of 600 months would be awarded for the year. The main reason for the lower than expected performance was the postponement of three courses to 1995 at the request of the concerned host institutions. Table 1 below provides the distribution of fellowships by programme areas.

Table 1. 1994 UNU fellowships by programme area

Universal Human Values and Global Responsibilities	
Conflict resolution and ethnicity	1
Sustaining Global Life-Support Systems	
- Geothermal energy	14
- Integrated Studies in Ecosystems and Information Systems for Environmental Management	10
Advances in Science and Technology	
- UNU/IIST	9
- UNU/IIST Ph.D. Internships	6
- UNU/BIOLAC	18
- Microinformatics	3
- Other fields	4
Population Dynamics and Human Welfare	
- Food and Nutrition	15
Total	80

137. The National Energy Authority of Iceland (Orkustofnun), an active UNU associated institution, organized the sixteenth course of the UNU Geothermal Training Programme. The six-month course was attended by 16 participants from various countries in Africa, Asia, Europe and Latin America, of whom 14 were UNU fellows. One participant from Uganda was supported by UNDP, and another from Russia obtained separate support from the Icelandic Government. Unfortunately, one of the UNU fellows was not able to complete the course because of illness. The UNU Geothermal Training Programme, which has the distinction of being the longest-running UNU training activity, has been held without any interruption since 1979. Some 147 scientists and engineers from 29 countries have participated in the training. Out of this number, 133 obtained their training under UNU fellowships for which the Icelandic Government covered the major portion of the expenses. Most of the rest were supported by UNDP. Specialized training is offered in geological exploration, borehole geology, geophysical exploration, borehole geophysics, reservoir engineering, chemistry of thermal fluids, geothermal utilization and drilling technology. Each trainee attends only one specialized course of study which is tailor-made to meet his/her individual and institutional needs and is required to undertake a research project.

138. In 1994, the first group of five trainees under the UNU-Kirin fellowship scheme selected from China, the Philippines, Thailand and Viet Nam received their one-year training at the National Food Research Institute (NFRI) in Tsukuba, Japan. The fellows presented the results of their research work at a ceremony that was held at UNU headquarters in early April during which they also received UNU Certificates from the Rector of the University. The event was attended by the President and other officials of the Kirin Brewery Company, the Director-General and other officials of NFRI, the fellows' advisers, officials of the Japan Foundation for UNU and staff of the University. The occasion was used to welcome the five recipients of the UNU-Kirin fellowships for the 1994-1995 programme and to give them an orientation on UNU and its activities. With regard to support for follow-up research which is an important and innovative feature of the UNU-Kirin scheme, three fellows from the 1994 class were provided research support on the basis of the proposals that they submitted to UNU through their respective heads of institutions. The maximum amount of grant that can be made available to any one fellow is US$ 15,000 through a contractual arrangement between the fellow's institution and UNU. The funds are to be used primarily for procuring laboratory supplies and small equipment that are not readily available in the institution. A joint UNU/NFRI programme committee met three times in the course of the year to monitor the progress of the activities of the fellows and to review the follow-up research proposals for which it developed a set of guidelines.

139. The annual six-month course on remote sensing technology and its uses for surveying, planning and management of natural resources was held at the Instituto Nacional de Pesquisas Espaciais (INPE) in Brazil. A total of eight fellows selected from the other Latin American countries participated in the course. The course was organized under the framework of the agreement of cooperation between UNU and CAPES/CNPq, two agencies of the Brazilian Government, which shared the expenses of the fellowships. In another training activity in Brazil under the same cost-sharing arrangement, two fellows from Uruguay and one from Cuba joined the two-year masters degree programme in science and technology policy at the Universidade Estadual de Campinas (UNICAMP).

140. As in 1993, UNU/BIOLAC was active in promoting the exchange of scientists in Latin America. A total of 18 fellowships ranging in duration from 3 to 12 months were awarded under the programme for research attachments in the leading biotechnology institutions in Latin America. In terms of fellowship months, this represents about 20 per cent of the fellowships awarded by UNU during the year. On the other hand, only two short-term courses were organized in contrast to the six courses that were held in 1993. This was due to two reasons: a reduced budget and the logical consequence of change that was instituted in programme management and coordination which resulted in discontinuing the services of two of the project coordinators. This in turn caused the postponement of two courses that were originally scheduled to take place during the year.

141. Under its Ph.D. Internship Scheme, UNU/INTECH accepted six more in 1994 to carry out part of their dissertation work under the supervision of its academic staff for periods ranging from two to six months. The Institute is also in the

process of inaugurating a joint Ph.D. programme with the Maastricht Economic Research Institute on Innovation and Technology of the University of Limburg.

142. The training activities of UNU/IIST took place both at the location of the Institute in Macau and in other developing countries. During the year, a total of nine fellowships were awarded for training in research techniques or in advanced software development techniques at Macau. The fellows were selected from China, Indonesia and Viet Nam through personal interviews. Ten fellows completed their studies during the year. UNU/IIST organized training workshops with durations varying from a few days to two weeks in Macau, China, the Democratic People's Republic of Korea, Indonesia and the Philippines. It also gave a 14-week course in formal semantics to 35 masters degree students at the University of Macau, and the staff of UNU/IIST provided advice to three students who were doing thesis work for a B.Sc. degree. The total number of participants who attended these training activities organized in Macau and elsewhere came to around 290.

143. The long-interrupted joint UNU-ICTP training programme in microprocessors and informatics was recently activated with the grant that UNU received in 1993 from the Government of Italy. The International Workshop on Parallel Processing and Applications in Physics, Chemistry and Material Science was held in September at the International Centre for Theoretical Physics (ICTP) in Trieste, Italy. This three-week training workshop drew about 60 participants. Another training activity on Microprocessor-based Real-Time Control: Principles and Applications in Physics was also held in Trieste in early autumn. This month-long workshop also had about 60 participants. A third training course on Basic VLSI (Very Large Scale Integration) took place at the Microprocessor Laboratory in Trieste from 21 November to 16 December and drew a total of 60 participants. At the University of Yaounde in Cameroon and other universities in West and Central Africa, a total of 11 courses were given by guest lecturers with the support of UNU. Most of the courses had a duration of two weeks. The UNU-Irish Microinformatics Project was concluded during the year with the award of the last two fellowships. At the Second African Workshop on University/Industry Cooperation that was held under the project in Kampala, Uganda, in April, the elements of a proposal that will eventually be submitted by UNU to the Government of Ireland for funding was discussed.

144. The cooperation between UNU and the University of Geneva in Switzerland in organizing the six-week course for 15 participants on Natural Hazard reduction continued during 1994. UNU provided direct support to six of those participants. In a related training activity, a senior scientist from the Philippines was awarded a UNU fellowship to carry out research training in flood disaster mitigation at the University of Tokyo. Another senior scientist from Madagascar who is involved in the UNU project in Mountain Ecology and Sustainable Development spent a three-month research attachment at the University of Paris, France.

145. All in all, 621 individuals participated in UNU training workshops during the year. In the workplan for 1994, a target number of around 500 had been envisaged. This higher performance is largely due to the increased number of training workshops that were organized by UNU/IIST, which places a high degree of commitment on its training function as a UNU research and training centre.

UNU fellowships and training

146. Eighty UNU fellowships were awarded in 1994 as compared with 83 in 1993. UNU fellows in 1994 came from Algeria, Argentina, Bangladesh, Brazil, Bulgaria, Cameroon, Chile, China, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Ethiopia, Germany, Ghana, Guatemala, India, Indonesia, Jordan, Lebanon, Madagascar, Nepal, Nigeria, Panama, Paraguay, Peru, the Philippines, Poland, Portugal, Sudan, Thailand, Turkey, Uganda, the United Republic of Tanzania, Uruguay, Venezuela, Viet Nam and Zambia. Fifty-seven per cent of the UNU fellows trained in 1994 received training at institutions in developing countries; 43 per cent received training at institutions in industrial countries. The main areas of UNU training in 1994 included: applied human nutrition, biochemistry, biotechnology, flood disaster mitigation, food composition data, food science and technology, geography, geothermal energy, microinformatics, remote-sensing technology, renewable energy systems, science and technology policy and software technology. More than 600 individuals attended UNU training workshops in 1994.

IV. DISSEMINATION OF RESEARCH FINDINGS

147. Dissemination is central to the work being done by many United Nations organs, but it is especially important to one that is also an international university carrying out research and educational activities. Through dissemination, the results of such activities, particularly those of policy relevance, are made known and available to potential recipients and users, including other United Nations agencies and organs, United Nations Member States, institutions of higher learning and scholars, particularly in developing countries, and interested persons among the general public. Dissemination to scholars and experts studying similar problems is important because it helps to corroborate findings, evoke critical comments or indicate possible new directions of research.

148. In 1994, dissemination of the results of UNU work continued to be carried out mainly through the publication of books, proceedings, reports, papers, journal articles, and journals, through public affairs activities, such as meetings, press interviews, press releases, and the publishing of newsletters and reports, and through public meetings of an academic nature.

149. Publishing was carried out by the University publishing arm, as well as in collaboration with other scholarly publishers in different countries. During the year, 28 books were published, mainly in the areas of science and technology, development economics, urban problems, political and administrative development, social development, and environmental problems. Notable among these were: The Uncertain Quest: Science, Technology, and Development, edited by Jean-Jacques Salomon, Francisco Sagasti, and Céline Sachs-Jeantet, Technology and Innovation in the International Economy, edited by Charles Cooper, Technological Independence: The Asian Experience, edited by Saneh Chamarik and Susantha Goonatilake, The Fifth Tiger: A Study in Thai Development Policy, by Robert Muscat, Local Government and Market Decentralization: Experiences in Industrialized, Developing, and Former Eastern Bloc Countries, edited by Robert J. Bennett, Industrial Metabolism: Restructuring for Sustainable

Development, edited by Robert U. Ayres and Udo E. Simonis, and Global Economic Cooperation: A Guide to Agreements and Organizations, edited by Bernard Colas. The impact of some of these results can be seen in the descriptions, which include some book reviews, of work carried out during the year.

150. Four UNU journals were also issued during the year. These are: Food and Nutrition Bulletin, Journal of Food Composition and Analysis, Mountain Research and Development, and ASSET (Abstracts of Selected Solar Energy Technology). Within area I of the MTP: Universal human values and global responsibilities, UNU is preparing to launch a new journal entitled: Global Governance: A Review of Multilateralism and International Organizations jointly with the Academic Council for the United Nations System (ACUNS). The first issue has been completed and distribution is to commence by the end of 1994. In addition, the UNU has agreed with l'Université René Descartes Paris V to cooperate in the publication of the French-language journal Le Trimestre du Monde which is dedicated to analysing issues of international relations from a global perspective.

151. During 1994, numerous reports, working papers and journal articles were issued by the UNU. Particularly evident in 1994 was the increased dissemination from UNU research and training centres in the form of such reports and working papers. For a complete listing of UNU titles in 1994, please refer to attached annex II.

152. Dissemination, particularly through sales of books, published in previous years was also vigorous. The income from sales of publications in 1994 was approximately US$ 236,000.

153. The UNU also maintained 61 depository libraries during 1994. The UNU would like to increase the geographic coverage and number of such depository libraries, but such efforts are linked to the availability of additional funding.

154. In addition to targeted dissemination of publications, the UNU also sought to increase its visibility through enhanced public information and media contacts. The UNU Centre in Tokyo worked to increase and broaden distribution of press notices and releases in Japan and internationally. The UNU Office in North America (UNU/ONA) worked closely with the Department of Public Information of the Secretariat to enhance press coverage from New York of UNU academic activities world wide and similar efforts were made through other UNU offices. Efforts were made to broaden the visibility of the UNU among permanent missions to the United Nations in New York and such activities are expected to be strengthened in the future. Progress was made in building an integrated database of contacts in North America, and particularly the United Nations offices in New York, towards this end. 1994 did see increased coverage of UNU academic events particularly by the print media, particularly in Japan, but much remains to be done to further heighten interest in and knowledge of UNU's work.

About UNU books

155. Since 1975, the UNU has published some 375 books through UNU Press and through specific co-publishing arrangements. In 1994, 12 books were issued by UNU Press and 18 books were published through specific co-publishing arrangements. Revenue generated by the sale of UNU publications in 1994 was approximately US$ 236,000. The UNU maintained 61 depository libraries in 50 countries during 1994.

V. THE STATE OF THE UNIVERSITY - 1994

156. In 1994, the UNU neared the completion of the first two decades of its academic work. 1995 will mark the twentieth anniversary of the UNU at the time when the United Nations celebrates its fiftieth anniversary. The world has changed considerably over the period since the University commenced its operations from a suite of rooms at the Imperial Hotel in Tokyo in 1975. The concept of the UNU when it was founded comprised a novel structure designed to link together members of the international scholarly community through a unique operational methodology. The networking principle which is so integral to the UNU's work was indeed innovative and made the best use of existing institutions and resources required when the UNU was established by the General Assembly. Some 19 years later, international academic cooperation has changed; the nature and approach of scholarly work among research universities and institutions has made some progress beyond discipline-based rigidity towards more multidisciplinary and issue-oriented approaches to global problems. The development of UNU research and training centres and the extension of the University's coverage of issues and its outreach brought by these new centres since 1985 has now been copied by other international institutions, as a means to extend ongoing work and in order to mobilize additional resources in a donor-fatigued world. In 1994, the University continued to extend the outreach of its educational activities to the international academic community, at the same time striving to make more of a substantive contribution to the work of the United Nations. Against this background, the University faced continued resource constraints brought on by lower overall investment income from its endowment fund together with increased competition for limited resources to be received from Governments, development assistance agencies, foundations and others. Mobilization of operational contributions and of untied or unearmarked funding has become increasingly difficult in the last decade and there exists a danger of UNU programmes becoming too donor driven if the core resources continue to be insufficient and if full attention is not paid to UNU priorities and autonomy.

157. To heighten interest in and visibility of the University's work, the institution has sought to rededicate itself to ensuring the maximum possible impact of its work in a changing world situation. The elaboration of a "mission statement" during the second half of the year helped to sharpen the focus on the University's institutional goals as an international educational institution and an autonomous entity of the United Nations. An institutional strategy paper setting out the programmatic development goals to take the UNU into the twenty-first century was prepared and received the comments and endorsement of the UNU Council at its forty-first session held in early December in Accra, Ghana.

158. In line with these initiatives and with effect from 1 January 1994, the University Centre was reorganized to ensure better coverage of key activities related to strengthening the coherence of the UNU academic programme. The Planning and Development Division was merged with the Headquarters Academic Division to strengthen overall academic planning and the capacity to ensure better academic coordination University-wide. The UNU Press became a part of the Academic Division to help improve overall integration of research, capacity-building and dissemination activities. Additional emphasis was placed on fund-raising, public affairs and institutional relations, and these functions were accordingly moved within the Office of the Rector. Some consolidation was achieved within the Administrative Services Division in order to augment staff resources which could then be allocated to academic activities.

159. The Council of the University met in its forty-first session in late November and early December in Accra, Ghana. The Bureau of the Council met in early August in New York to prepare the work of the Council and in particular to discuss possible changes in the structure of the Council session, the function and role of the Bureau, the Council standing committees and the plenary. A new format for the Council session was discussed and put into place for the forty-first session in Accra.

160. In addition to the draft mission statement and the institutional strategy paper mentioned above, the Council considered an appraisal report of an internal assessment group of the Council. The Internal Assessment Group (IAG) met three times during 1994 interacting with the Conference of Directors, the Rector, and individual RTC directors as well as University Centre staff. The report of the IAG called for the UNU to take a leading coordinating role in United Nations research initiatives and activities and to act as a coherent whole in which mutually complementary relations of cooperation between the Centre and research and training centres are further developed. The assessment indicated that better integration of UNU's research, training and dissemination initiatives was needed and that new arrangements for extending the training and fellowship programme were required. The assessment report also called for more effective dissemination of UNU publications. The need to strengthen the UNU Centre and for it to provide better overall coordination of the University academic programme among research and training centres and programmes were also key recommendations of the assessment report.

161. The Council requested the Rector to integrate the essential components of the assessment report and the institutional strategy paper and mission statement with a view towards the preparation of a third UNU Medium-Term Perspective.

162. The Board of UNU/WIDER met in its tenth session in mid-June 1994 and reviewed the work of the Institute over the previous year taking note of the developments of the academic work of UNU/WIDER and its improved interaction with the academic community in its host country of Finland. The Board of UNU/INTECH met in late June to review progress in the implementation of academic activities. The Board noted the efforts to develop the Institute's postgraduate education programmes being undertaken with universities and research institutes located in the Netherlands, and the progress made in strengthening international academic network connections. The Board of UNU/IIST met in late September to review the ongoing work of the Macau-based institute, particularly the progress

made in implementing a series of R&D projects closely linked with high-level education-based workshops, conducted both in-house and off-shore in a regionally focused approach.

163. Efforts by the Rector and the Directors of research and training centres to enhance coordination and coherence of UNU academic activities continued in 1994 through two Conferences of Directors held in Paris in April and in Accra in November. Among the topics taken up at these meetings were the formulation of a new institutional strategy to guide the work of the UNU into the next century, an academic personnel policy for the University system, new arrangements for capacity-building and postgraduate studies within the UNU and ways to improve cooperative interaction with the United Nations system.

164. During 1994, senior staff at the UNU headquarters were engaged in frequent and detailed discussions with officials of the Government of Japan, and the Tokyo Metropolitan Government, concerning the funding requirements of the UNU's proposed Institute of Advanced Studies (UNU/IAS). While a previous funding arrangement whereby the pledge of the Tokyo Metropolitan Government to provide approximately US$ 5 million per annum for the UNU/IAS has essentially been frozen, discussions with the central Government were aimed at achieving an interim solution to enable the UNU to start up activities of the UNU/IAS in mid-1995 when the premises, being made available to the University by the Tokyo Metropolitan Government, are expected to be completed. At the time of preparation of this report, discussions with government officials in Japan have not resolved sufficiently the funding situation to meet the criteria for establishment of a UNU research and training centre as set down by the UNU Council. An assured commitment of the long-term funding has not been received to enable the UNU Council to take a decision regarding the formal establishment of the Institute. The level of funding proposed by the Government of Japan remained insufficient to enable the Rector to recruit the first Director of the Institute or to begin to put together the critical mass of researchers required for such an institute. The magnitude of the funding commitment from the host Government falls far short of the level of funding required to initiate a programme of research, capacity-building and dissemination of sufficient quality and which would generate visibility and impact as is expected by the UNU Council. The University was encouraged by a statement made by the Permanent Representative of Japan at the 1994 session of the Second Committee of the General Assembly in which he expressed the commitment of the Government of Japan to help establish the UNU/IAS in time for the occupation of the premises in mid-1995.

165. The University continued to strengthen its interaction with other United Nations organizations during the year. The UNU is making an intensive effort to ensure that the results of its work feed into the deliberations and the operational activities of the United Nations. The University prepared policy papers for presentation at the Global Conference on the Sustainable Development of Small Island Developing States, the International Conference on Population and Development, the World Conference on Natural Disaster Reduction and the World Summit for Social Development preparatory process. Substantive contributions are being prepared for the World Conference on Women scheduled to be held in Beijing in September 1995 and UNCTAD IX. The University also intensified its research efforts in support of the United Nations Secretariat

through studies on mine-clearance technology and peace-keeping operations conducted for the Department of Humanitarian Affairs and the Department of Peace-Keeping Operations. Cooperative projects were also initiated with UNFPA, UNDP, Habitat, UNEP and UNITAR. The University's work with the specialized agencies of the United Nations has evolved along the same pattern, this being true in regard to UNESCO, one of the University's sponsors. A continuing process of consultation, interaction and cooperation with other United Nations entities will remain at the forefront of the University's institutional goals.

166. The UNU made considerable progress during 1994 in the implementation of activities under its Programme on Environmentally Sustainable Development (UNU Agenda 21). The UNU was able to move forward in building a set of postgraduate education and capacity-building activities in Tokyo and with institutions in Thailand and India within Agenda 21. Capacity-building and policy-oriented research were highlighted as an important priority for the programme as proposed by a special Advisory Team established by the Rector in 1993 to assist the UNU in formulating a consistent overall framework for its activities related to environment and development.

167. Also within its Agenda 21 programme, the UNU launched a major new research effort aimed at achieving technological breakthroughs which will facilitate manufacturing without any form of waste. The so-called Zero Emissions Research Initiative (UNU/ZERI) has established linkages among companies, industrial policy makers and researchers in order to initiate a long-term research programme to find ways to transform current manufacturing systems into new types of production that do away with wastes and emissions. Feasibility studies on key industrial clusters are reviewing industrial and re-engineering opportunities, taking stock of the types of outputs used in different manufacturing processes, preparing output-input models to determine the best clustering of industries for zero emissions, identifying breakthrough technologies required to make the industrial clusters economically viable; and formulating specific policy recommendations for different levels of government. To mobilize additional support and to exchange information on design and implementation of the global multidisciplinary research programme, the UNU will organize the first World Congress on Zero Emissions at its headquarters in early April 1995.

168. Following the recommendations of the Council, the Rector sent two missions to Amman, Jordan, to discuss the development of a proposed leadership initiative. As a result, a more concrete proposal with phases of implementation and a defined organizational structure was agreed upon, and the Government of the Hashemite Kingdom of Jordan agreed to provide financial support for this initiative. The Council at its forty-first session approved the establishment of an "academy of leadership" which will start by having an annual forum of 30-40 participants in a non-conventional educational/training programme which will provide opportunities for young leaders to interact with senior policy makers and statesmen.

169. Discussions continued in 1994 with officials of the Government of the Province of Ontario and the Government of Canada on the establishment of an international network based in Canada on water, environment and health. The UNU International Network on Water, Environment and Health (UNU/INWEH) calls for

linking selected Canadian universities with a number of international cooperating units in developing regions of Africa, Asia and Latin America. The goal of the network is to make concrete contributions through research, capacity-building and dissemination and information technology. The Premier of Ontario wrote to the Rector in April confirming the intention of the Government to provide half of the core funding for UNU/INWEH up to C$ 10 million over a five-year period beginning in fiscal year 1994/95. The commitment envisages matching support from the federal Government. A decision on the level of support from the Government of Canada is still being awaited at the time of the preparation of this report.

170. In furthering the University's approach to the development of long-term initiatives related directly to the work of the United Nations, the Rector convened a special advisory team to assist him in putting together a "UNU Agenda for Peace and Global Governance". The advisory team suggested a possible direction and focus for a UNU programme of research, policy reflection and training in the area of peace and global governance. As in the case of UNU's Programme on Environmentally Sustainable Development (UNU Agenda 21) which was developed through a similar mechanism, the UNU's Agenda for Peace and Global Governance covers a five-year time horizon. It aggregates, under a new frame, current programme activities in programme area one of the UNU's MTP II (1990-1995). The agenda proposes activities to be undertaken directly by UNU or to be financed and managed by UNU, but also indicates where UNU might instead play a catalytic role, facilitating and supporting the work of others in the context of a consistent overall programme framework. It is expected that this programme will be implemented through the proposed UNU research and training centre on the study of governance to be located in Barcelona, Catalunya, Spain. Other activities will be carried out from the UNU headquarters in Tokyo and possibly, from the UNU/IAS if and when it is established.

171. Dr. Boutros Boutros-Ghali, Secretary-General of the United Nations, visited the UNU headquarters on 13 September 1994 to meet with the staff of the University and with representatives of other United Nations offices located in Japan. The Secretary-General indicated that the role of the UNU must be to help understand more about the problems of today and the problems which will face the next generations. He called upon the UNU to make additional contributions and inputs into the work of the United Nations. He also agreed that it was incumbent on the United Nations Secretariat and other parts of the United Nations to make better use of the University and its work.

172. As of 31 December 1994, pledges to the Endowment Fund and operating contributions made by 51 Governments and seven other benefactors totalled some US$ 278.5 million, of which US$ 249.8 million had been received. The University also benefited during the year from counterpart and other support, including cost-sharing support for fellowships and other activities. Contributions based on new and existing pledges for UNU research and training centres and programmes and modest operational contributions were received during the year. Table 2 below provides a summary of the contributions of US$ 100,000 magnitude and greater received this year.

Table 2. Financial contributions received during 1994 (over US$ 100,000)

(As of 31 December 1994)

Source	Purpose	(Unit: US$) Amount
Governments:		
Austria	Endowment Fund	127 289
China	Endowment Fund earmarked for UNU/IIST	1 000 000
Ireland	UNU/Irish Government Microprocessor Informatics Project	114 461
Macau	Endowment Fund and operating contribution earmarked for UNU/IIST	4 747 506
Netherlands	Operational costs for UNU/INTECH	769 313
Portugal	Endowment Fund earmarked for UNU/IIST	1 000 000
Spain: Generalitat de Catalunya	Earmarked for transitional programme of the proposed RTC on Governance in Barcelona	308 036
	Subtotal	8 066 605
Non-governmental agencies and private sector:		
United Nations	Government of Japan Trust Fund for International Cooperation for Development: Public Symposium on Issues of Global Governance, and Committee meeting	226 000
	Government of Japan Trust Fund for projects related to the work of the Commission on Global Governance	700 000
Kirin Brewery Co.	UNU/Kirin Fellowship	307 439
Obayashi Corporation	UNU Global Environmental Forum IV	101 010
	Subtotal	1 334 449
	Total	9 401 054

173. The University made additional efforts during the year to inform a larger audience about its work. Special efforts were made to inform the heads of other United Nations organizations about the ongoing work of the UNU, and discussions were aimed at ensuring cooperation and interaction when it was possible. The Rector, aided immeasurably by the Chairperson of the UNU Council, Dr. Lucille Mair, Permanent Representative of Jamaica to the United Nations, made special efforts to brief heads of permanent missions to the United Nations in New York. Two working luncheons were held in February and in November at which a total of 30 ambassadors were present.

174. The University held numerous seminars, workshops and symposia around the world during the year. Conference facilities at the UNU headquarters in Tokyo were used actively by the University and by other organizations. Twenty-one academic events were held at the UNU headquarters in Tokyo attended by more than 5,250 scholars, diplomats and members of the general public, including government officials, business leaders and NGO representatives. These events attracted attention and coverage by the international media in articles which raised the profile of the University in the public eye.

175. In 1994, Dr. Hanaa Kheir-El-Din, Professor of Economics and Chairperson, Department of Economics and Political Sciences, Cairo University, was appointed by the United Nations Secretary-General and the UNESCO Director-General to serve as a member of the UNU Council for the period 1994-1998.

176. The new Director-General of the Food and Agriculture Organization of the United Nations (FAO), Mr. Jacques Diouf, who had served as a member of the Board of UNU/WIDER since 1991, resigned from the Board after assuming his new responsibilities at FAO. Dr. Said El-Naggar from Egypt, who had served as a member of the Board of UNU/WIDER since 1991, informed the Rector of his resignation from the Board of UNU/WIDER owing to other pressing commitments. Dr. Maria de Lourdes Pintasilgo, Deputy Chairperson, InterAction Council (Portugal), and Dr. Masaru Yoshitomi, Vice-Chairman, Research Institute, Inc. of the Long-term Credit Bank of Japan, and Mr. Philip Ndegwa, Chairman of the First Chartered Securities, Ltd., Nairobi, Kenya, were each reappointed to the Board of UNU/WIDER for a further term of four years. Professor Antti Tanskanen, President of the Academy of Finland was appointed to the Board of UNU/WIDER for a term ending 31 December 1997.

177. Dr. Jose Pelucio Ferreira, President, Fundação Padre Leonel Franca, Pontificia Universidade Catolica - RJ, Brazil, resigned from the Board of UNU/INTECH in May 1994. Ms. Winnie K. Byanyima, former Deputy Permanent Representative of Uganda to UNESCO, Kampala, Uganda, was appointed as a member of the Board of UNU/INTECH for a term which will end on 31 December 1997.

178. Professor Ana Regina Cavalcanti da Rocha, Programa de Engenharia de Sistemas e Computaçao (COPPE), Universidade Federal do Rio de Janeiro, Brazil, was appointed as a member of the UNU/IIST Board for a term ending 31 December 1997. The appointment follows the resignation of Professor Mario Nascimento Ferreira, Rector of the University of Macau, earlier in the year.

Notes

1/ Craib, J. A., Survey of Mine Clearance Technology, UNU and the United Nations Department of Humanitarian Affairs, September 1994.

2/ K. Krause and W. Andy Knight (eds.), State, Society and the United Nations System: Changing Perspectives on Multilateralism (UNU Press, 1995).

3/ C. F. Alger, G. M. Lyons and J. E. Trent (eds.), The United Nations System: The Policies of Member States (UNU Press, 1995).

4/ Sakamoto, Yoshikazu (ed.), Global Transformation. Challenges to the State System (UNU Press, 1994).

5/ K. Rupesinghe and M. Rubio C (eds.), The Culture of Violence (UNU Press, 1994).

6/ Helleiner, G. K. (ed.), Trade Policy and Industrialization in Turbulent Times (Routledge, 1994).

7/ L. Klein, F-C. Lo and W. McKibbin (eds.), Arms Reduction: Economic Implications in the Post-Cold-War Era (UNU Press, forthcoming).

8/ Y. Kaya and K. Yokobori (eds.), Global Environment, Energy and Economic Development (forthcoming).

9/ UNU Programme on Environmentally Sustainable Development: UNU Agenda 21. Advisory Team Report. Tokyo: The United Nations University, 1993.

10/ R. U. Ayres and U. E. Simonis (eds.), Industrial Metabolism: Restructuring for Sustainable Development (UNU Press, 1994).

11/ Clusener-Godt, Miguel, Ignacy Sachs and Juha I. Uitto, 1992, Conference on Environmentally Sound Socio-Economic Development in the Humid Tropics: Final Report. Manaus UNAMAZMAB/UNESCO-UNU-TWAS; Uitto, Juha I. and Miguel Clusener-Godt, 1993, Environmentally Sound Socio-Economic Development in the Humid Tropics: Perspectives from Asia and Africa. Tokyo, the United Nations University.

12/ Katayama, Tsuneo, 1994. International Decade for Natural Disaster Reduction: Working Against Time. United Nations University Lectures 8. Tokyo: the United Nations University.

13/ Cooper, Charles (ed.), Technology and Innovation in the International Economy (UNU Press, 1994).

14/ R. J. Fuchs, E. Brennan, J. Chamie, F-C. Lo and J. Uitto (eds.), Mega-City Growth and the Future (UNU Press, 1994).

15/ Y-M. Yeung and F-C. Lo, Emerging World Cities in Pacific Asia: Growth and Adjustment to Global Restructuring (forthcoming).

16/ Kawashima, Tatsuhiko (ed.), Tokyo: A Mega-City in Transition (forthcoming).

17/ Gilbert, Alan (ed.), Mega-Cities in Latin America (forthcoming).

18/ Rakodi, Carol (ed.), Challenge of Urban Growth in Africa (forthcoming).

Annex I

UNU ACADEMIC PROGRAMME FOR 1994-95

Programme area	Responsible unit (existing and prospective)	
Universal human values and global responsibilities		
1. The United Nations system, global governance and security	Centre	IAS
2. Conflict resolution and ethnicity	Centre, INCORE	
3. Governance, state and society	Centre, WIDER	CESG, Leadership
4. Culture and development	Centre	
New directions for the world economy		
5. Growth and sustainable development	WIDER, Centre	
6. Socio-economic dimensions of development	WIDER, INTECH	
7. Global change and perspectives	Centre, WIDER	
Sustainable global life-support systems		
8. Eco-restructuring for sustainable development	Centre, WIDER, INTECH	IAS
9. Integrated studies of ecosystems	Centre, WIDER	INWEH
10. Information systems for environmental management	Centre, IIST	
11. Natural resources in Africa	INRA	
12. Environmental law and governance	Centre	CESG
Advances in science and technology		
13. Socio-economic implications of new technologies	INTECH	
14. Applications of biotechnology for development	BIOLAC	
15. Software technology for developing countries	IIST	
16. Microprocessors and informatics	Centre	

Programme area	Responsible unit (existing and prospective)	
Population dynamics and human welfare		
17. Population, urbanization and development	Centre, WIDER	IAS
18. Population, land management and environmental change (PLEC)	Centre, INRA	
19. Food and nutrition for human and social development	Centre	F&N

BIOLAC: Programme on Biotechnology for Latin America and the Caribbean (Caracas, Venezuela)

INCORE: Joint International Programme on Conflict Resolution and Ethnicity (Ulster, Northern Ireland)

INRA: Institute for Natural Resources in Africa (Accra, Ghana, with a mineral resources unit in Zambia)

IIST: International Institute for Software Technology (Macau)

INTECH: Institute for New Technologies (Maastricht, the Netherlands)

WIDER: World Institute for Development Economics Research (Helsinki, Finland)

CESG: Centre for the Study of Governance (Barcelona, Spain)

IAS: Institute of Advanced Studies (Tokyo, Japan)

INWEH: International Network on Water, Environment and Health (Joint International Programme with Ontario, Canada) (Ontario, Canada)

F&N: Food and Nutrition Research and Training Coordinating Centre at Cornell University (New York, USA)

Leadership: Research and Training Programme on Leadership (Amman, Jordan)

Annex II

TITLES PUBLISHED IN 1994

Books

Bolivia and Coca: A Study in Dependency (Studies on the Impact of the Illegal Drug Trade, vol. 1)
By James Painter, Lynne Rienner Publishers, Inc. and UNU Press

Culture, Development, and Democracy: The Role of the Intellectual
Edited by Selo Soemardjan and Kenneth Thompson, UNU Press

The Culture of Violence
Edited by Kumar Rupesinghe and Marcial C. Rubio, UNU Press

Dignity and Daily Bread: New Forms of Economic Organizing among Poor Women in the Third World and the First
Edited by Sheila Rowbotham and Swasti Mitter, UNU/WIDER with Routledge

Expanding Access to Science and Technology: The Role of Information Technologies
Edited by Ines Wesley-Tanaskovic, Jacques Tocatlian, and Kenneth H. Roberts, United Nations University

The Fifth Tiger: A Study of Thai Development Policy
By Robert J. Muscat, UNU/WIDER with M. E. Sharpe, Inc. and UNU Press

Gender and National Identity: Women and Politics in Muslim Societies
Edited by Valentine M. Moghadam, UNU/WIDER with Zed Books

Global Economic Co-operation: A Guide to Agreements and Organizations
Edited by Bernard Colas, Mercury Business Books Ltd., Kluwer Law and Taxation Publishers, and UNU Press

Global Transformation: Challenges to the State System
Edited by Yoshikazu Sakamoto, UNU Press

Green-Alternative Politics in West Germany: Vol. II The Greens
By Saral Sarkar, Promilla & Co., Publishers and UNU Press

History of the United Nations University: A Personal Perspective
By C. V. Narasimhan, UNU Press

Identity Politics and Women: Cultural Reassertions and Feminism in International Perspective
Edited by Valentine M. Moghadam, UNU/WIDER with Westview Press, Inc.

Industrial Metabolism: Restructuring for Sustainable Development
Edited by Robert U. Ayres and Udo E. Simonis, UNU Press

International Waters of the Middle East: From Euphrates-Tigris to Nile
Edited by Asit K. Biswas, OUP India

Local Government and Market Decentralization: Experiences in Industrialized Developing, and Former Eastern Bloc Countries
Edited by Robert J. Bennett, UNU Press

Mega-City Growth and the Future
Edited by Roland J. Fuchs et al., UNU Press

Ocean Governance: Sustainable Development of the Seas
Edited by Peter Bautista Payoyo, UNU Press

Political Economy and Illegal Drugs in Colombia: Studies on the Impact of the Illegal Drug Trade, Vol. 2
By Francisco E. Thoumi, Lynne Rienner Publishers, Inc. and UNU Press

La quête incertaine: science technologie développement (French edition of The Uncertain Quest: Science, Technology and Development)
Edited by Jean-Jacques Salomon, Francisco Sagasti, Céline Sachs-Jeantet, Economica and UNU Press

State, Society, and the UN System: Changing Perspectives on Multilateralism
Edited by Keith Klause and W. Andy Knight, UNU Press

Technological Independence: The Asian Experience
Edited by Saneh Chamarik and Susantha Goonatilake, UNU Press

Technology and Innovation in the International Economy
Edited by Charles Cooper, UNU/INTECH with Edward Elgar Publishing Ltd. and UNU Press

Technology Change and Female Labour in Japan (English version of Gijutsu kakushin to joshi rodo)
Edited by Masanori Nakamura, UNU Press

Trade Policy and Industrialization in Turbulent Times
Edited by Gerald K. Helleiner, UNU/WIDER with Routledge

Transforming Humanity: The Visionary Writings of Soedjatmoko
Edited by Kathleen Newland, Kamala Chandrakirana Soedjatmoko (with a foreword by Clifford Geertz), Kumarian Press, Inc. and UNU Press

Tribal Identity and the Modern World
By Suresh Sharma, Sage Publications and UNU Press

The Uncertain Quest: Science, Technology, and Development
Edited by Jean-Jacques Salomon, Francisco R. Sagasti, and Céline Sachs-Jeantet, UNU Press

Winning the Battle to Lose the War: Brazilian Electronics Policy under US Threat of Sanctions
By Maria-Ines Bastos, UNU/INTECH with Frank Cass

Journals

ASSET, vol. 15, No. 4, vol. 16, No. 1
Tata Energy Research Institute (TERI)

Food and Nutrition Bulletin, vol. 15, Nos. 1-3
UNU Press

Global Environmental Change: Human and Policy Dimensions, vol. 4, No. 1 (special issue, Climate Change and World Food Security), vol. 4, No. 2, vol. 5 No. 1/2
Butterworth-Heinemann

Journal of Food Composition and Analysis, March/June 1994
Academic Press, Inc.

Mountain Research and Development, vol. 13, Nos. 1-4
University of California Press, for UNU and Int'l Mountain Society (IMS)

Annex III

MEMBERS OF THE UNU COUNCIL IN 1994

Appointed members

Dr. Lucille MAIR (Jamaica), Ambassador Extraordinary and Plenipotentiary and Permanent Representative to the United Nations, New York, the United States (Chairperson of the Council)

Mr. Vladimir DLOUHY (Czech Republic), Minister, Ministry of Industry and Trade, Czech Republic

Dr. Claude FREJACQUES (France), Professor and former Chairman, Centre national de la recherche scientifique, France (deceased)

Professor Josephine GUIDY-WANDJA (Côte d'Ivoire), Département de mathematiques, Université nationale de Côte d'Ivoire

Ambassador Hideo KAGAMI (Japan), former Permanent Representative of Japan to the United Nations

Dr. Sippanondha KETUDAT (Thailand), Chairman, National Economic and Social Development Board

Professor Hanaa KHEIR-EL-DIN (Egypt), Chairperson and Professor, Economics Department, Faculty of Economics and Political Science, Cairo University, Egypt

Professor Sang Soo LEE (Republic of Korea), Professor Emeritus, Korea Advanced Institute of Science and Technology

Professor Madina LY-TALL (Mali), Ambassador Extraordinary and Plenipotentiary of the Republic of Mali to France, Paris, France

Father Felipe E. MAC GREGOR (Peru), Chairman, Instituto de la Paz, Universidad del Pacifico, Peru

Dr. Edson MACHADO DE SOUSA (Brazil), Chefe de Gabinete do Ministro da Educação e do Desporto of Brazil

Dr. Abdel Salam MAJALI (Jordan), Prime Minister, Hashemite Kingdom of Jordan

Professor Lydia MAKHUBU (Swaziland), Vice-Chancellor and Professor of Chemistry, University of Swaziland

Dr. Vladlen A. MARTYNOV (Russian Federation), Director, Institute for World Economy and International Relations, Russian Academy of Sciences

Dr. Lucien F. MICHAUD (Canada), Professor, University of Sudbury, Canada

Dr. A. P. MITRA (India), President, National Academy of Sciences

Professor Jacob L. NGU (Cameroon), Director, Immunology Biotechnology Laboratories, Cameroon

Dr. Luis Manuel PENALVER (Venezuela), President, National Council for Education

Dr. Rafael PORTAENCASA (Spain), Rector, Polytechnical University of Madrid

Dr. Victor RABINOWITCH (United States), Senior Vice-President, MacArthur Foundation, United States

Professor Frances STEWART (United Kingdom), Senior Research Officer, Institute of Commonwealth Studies, International Development Centre, Queen Elizabeth House, United Kingdom

Professor J. A. VAN GINKEL (Netherlands), Rector Magnificus and Professor of Human Geography, Utrecht University

Professor Raimo VAYRYNEN (Finland), The John M. Regan, Jr. Director, The Joan B. Kroc Institute for International Peace Studies, University of Notre Dame, United States

Dr. WANG Shaoqi (China), Director-General, International Cooperation Department, State Science and Technology Commission

Ex-officio members

Dr. Boutros BOUTROS-GHALI (Egypt), Secretary-General, United Nations, New York, United States

Dr. Federico MAYOR (Spain), Director-General, United Nations Educational, Scientific and Cultural Organization, Paris, France

Mr. Marcel BOISARD (Switzerland), Acting Executive Director, United Nations Institute for Training and Research, Geneva, Switzerland

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